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XLI.

THE RESULTS OF OPERATION (LARYNGOFIS-
SURE) FOR INTRINSIC CANCER OF
THE LARYNX.*

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Surgical treatment of intralaryngeal cancer gives exceedingly good results, especially when compared with those obtainable by surgical treatment of cancer in other internal organs.

On examining this fact we find it to be due to the peculiar manner in which intrinsic cancer of the larynx originates and develops and spreads, as was originally pointed out by my friend, Sir Felix Semon. It would be interesting historically to consider the development of the pathology, diagnosis and treatment of intrinsic cancer of the larynx, but lack of time forbids me doing so. You must, however, permit me to state here in London, speaking to an assembly of prominent American and English surgeons, that, in my opinion, the whole of our present knowledge of the diagnosis and treatment of this

*Read before the fifth meeting of the Clinical Congress of Surgeons of North America at London.

disease is founded on the works of Semon and Butlin, who, towards the end of last century, entirely revolutionized our views with regard to the malignancy of intralaryngeal cancer. Before their day the surgical treatment of this disease had always been regarded as almost hopeless, but Semon showed us that the chief reason of this was that the disease was always diagnosed too late, so that it was too far advanced to give any good operative result.

Having further learned that intralaryngeal cancer in the great majority of cases appears as a primary cancer of the vocal cord, and therefore soon causes hoarseness, we have means of recognizing the disease at an early stage of its development, while still limited to the vocal cord, making a radical cure possible by removing the diseased vocal cord through a laryngofissure.

To illustrate the frequency of primary cancer of the vocal cord I wish to draw your attention to this table of sixty-six cases of intralaryngeal cancer which have come under my observation:

TABLE A.—PRIMARY SEAT OF INTRALARYNGEAL CANCER.

No specified localization.....	18 cases
Vocal cord	36 cases
Sinus Morgagni	2 cases
Arytenoid region	4 cases
Epiglottis	1 case
Ventricular band	5 cases
Total.....	66 cases

In the first eighteen cases the primary seat of the disease could not be localized, as the tumor had extended too far into the larynx when first observed.

The table clearly shows that cancer of the interior of the larynx, in by far the majority of cases, originates as a growth of one vocal cord, generally in the central part of it, and that it can, therefore, be radically removed. If the disease, however, has extended to the anterior commissure, the prognosis becomes more serious, as under these circumstances the thyrotomy cuts through the growth and may possibly be followed by a recurrence.

Those cancers of the larynx which do not primarily attack the vocal cords have, on the contrary, a bad prognosis; firstly, because they very often are not discovered and taken in hand

until they have spread so far that there is no possibility of a radical cure by means of a laryngofissure; secondly, because these extracordal cancers are generally of a more soft medullary character, growing quickly and with greater tendency to involvement of the neighboring lymphatic glands.

The only exceptions to this are the pedunculated adenocarcinomas which spring from the arytenoepiglottic folds. Of these I have seen three cases which had a relatively good prognosis and could be treated endolaryngeally with favorable results.

Having made the diagnosis by means of laryngoscopic inspection, supported by microscopic examination of a portion removed through the mouth, one has to remove the growth as soon as possible by means of a laryngofissure.

This operation should be performed as indicated by Butlin and Semon, who about 1890 inaugurated this treatment and proved that this comparatively safe operation was sufficient, if only performed soon enough.

I myself, chiefly following their instructions, have operated in the following manner:

The operation is always performed under general anesthesia. I begin with morphin-ether and make a low tracheotomy. Hahn's tampon cannula is introduced and the narcosis is continued with chloroform. The thyroid cartilage having been divided and the interior of the larynx opened, I fill the pharynx with sterilized gauze introduced from below through the split larynx in order to prevent the saliva from descending and interfering with the scene of action. According to Semon the larynx is packed with gauze soaked in a 10 per cent solution of cocain, to which I add a few drops of a 1 pro mille solution of adrenalin in order to make the mucous membrane of the larynx anesthetic and bloodless. Then the neoplasm, together with the whole diseased vocal cord, is removed by means of knife and scissors.

All the diseased area having been removed and the bleeding stopped, we formerly filled the larynx with a tampon of iodoform gauze, but after Butlin taught us to give up tamponing and to close the thyrotomy wound at once, the results of operation have been much better.

The patients are now able to swallow on the day of operation, and can leave their bed a few days later. This, of

course, is of the greatest importance in preventing complications in the lungs, especially in elderly people. My two eldest patients, respectively seventy-one and seventy-four years old, were able to leave their bed on the second day, and they are both alive and well now, at the age of eighty and seventy-six years.

Thyrotomy could only be performed in thirty-three of my cases treated up to 1912, as shown in the following table:

TABLE B.—RESULTS IN SEVENTY CASES OF CANCER OF LARYNX.

	Number of cases	Cured	Died or relapsed
No treatment	10	0	9
Tracheotomy	8	0	8
Endolaryngeal removal	5	1	4
Thyrotomy	33	18	15
Subhyoid pharyngotomy	1	0	1
Partial resection of the larynx...	4	0	4
Total resection	9	1	8
Total.....	70	20	50

The result of these thirty-three thyrotomies was that twenty-eight patients survived the operation, whilst five died from pneumonia, due chiefly to postoperative hemorrhage.

Amongst the twenty-eight patients, recurrence took place in ten cases, whilst eighteen are alive and well. These eighteen had the carcinoma entirely limited to the vocal cord, and the diagnosis was made at an early period of the disease—with only two exceptions. The first of these was a man aged forty-four years (see Table D, No. 11), who had a cancer of the posterior wall of the larynx, and whom I was able to follow for three years after the operation, when I lost sight of him. The second was a man, aged twenty-eight, suffering from an epithelioma of the left ventricular band, anterior commissure and the anterior part of the right ventricular band. This patient I operated on fourteen years ago; since then he has been on an expedition to the North Pole and is still alive and well.

The last four patients were operated in 1912, and have, therefore, only been under observation for about two years since the operation. But they were all cases of quite limited epithelioma of the vocal cord, and were operated so early that there is not much chance of recurrence.

Patient No. 7, a man aged sixty-one years, was operated in 1905 for a cancer of the vocal cord. During the following seven years his larynx remained perfectly healthy, but he now has a quickly growing cancer in the throat requiring tracheotomy. Ought this to be considered as a recurrence or as an accidental cancerous infection of a larynx which has kept perfectly healthy for seven years after operation? Personally I am inclined to look upon it as an accidental reinfection. In all the other cases of recurrence this took place within a year after the thyrotomy.

The functional result was exceedingly good in all cases. The voice was strong, generally sonorous, but in a few cases hoarse. The man aged seventy-one years was operated on in 1905; I saw him last in 1913, he was then seventy-nine years old and had a strong, healthy voice.

A clergyman aged fifty-five years, who was operated in 1896, fulfilled his duties for eight years and preached every Sunday in two churches.

The two men, aged respectively sixty-six and sixty-seven years, who were operated in 1912, are able to make speeches to large assemblies with a comparatively clear voice.

In order to get a broader basis of judgment as to the results of thyrotomy in cases of intrinsic cancer of the larynx, I have combined in the following table my own experiences and those of F. Semon, Chiari and St. Clair Thomson. The results are as follows:

TABLE C.—RESULTS OF OPERATION BY LARYNGOFISSURE.

	Number cases	Cure over 3 years	1 to 3 years	Under 1 year	Recur- rence	Death from operation
Semon	24	15	4	1	3	1
Chiari	29	11	4	—	11	3
Schmiegelow	33	11	7	—	10	5
St. Clair Thomson...	10	7	2*	—	1	0
	96	44	17	1	25	9

It will thus be seen that of ninety-six operated patients, fifty-two (equaling 63½ per cent) were cured for more than one year after the operation.

* (1) Secondary operation of removal of larynx, and now alive five years later. (2) Died from other causes fifteen months after laryngofissure.

TABLE D.—EIGHTEEN CASES OF INTRINSIC CANCER OF THE LARYNX THYROTOMIZED WITHOUT RECURRENCE.

No.	Age	Sex	Date of operat.	Time of observation	Annotations
1	62	Male	1892	18 years	Died in 1910, of cancer of rectum. Larynx free.
2	28	Male	1900	14 years	Alive; no recurrence.
3	50	Male	1904	10 years	Alive; no recurrence.
4	69	Female	1904	10 years	Alive; no recurrence.
5	71	Male	1905	9 years	Alive; no recurrence.
6	55	Male	1896	8 years	Died of cancer of stomach: no recurrence in larynx.
7	61	Male	1905	8 years	Alive.*
8	56	Male	1909	5 years	Alive; no recurrence.
9	47	Male	1905	4 years	Died of tuberculosis in 1909. Larynx free.
10	63	Male	1910	4 years	Alive; no recurrence.
11	44	Male	1896	3 years	Lost sight of.
12	55	Female	1911	3 years	Alive; no recurrence.
13	38	Male	1911	3 years	Alive; no recurrence.
14	66	Male	1911	2½ years	No recurrence; died of some other disease.
15	58	Male	1912	2 years	Alive; no recurrence.
16	67	Male	1912	2 years	Alive; no recurrence.
17	66	Male	1912	2 years	Alive; no recurrence.
18	74	Male	1912	2 years	Alive; no recurrence.

*Seven years after the operation cancer recurred in the larynx; probably new infection.

XLII.

TUBERCULOSIS OF THE MIDDLE EAR.*

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The frequency of middle ear involvement in tubercular individuals, especially in subjects of phthisis pulmonalis and in those of tubercular dyscrasia, was noted as early as the middle of the last century (Toynbee,¹ Von Troltsch,²). Wilde³ was familiar with the clinical picture presented by the painless onset, the discharge and peculiar appearance of the tympanic membrane in tubercular otitis media thirty years before Koch discovered the causative organism in 1882. In 1883 Eschle⁴ succeeded in finding the tubercle bacillus in middle ear discharge, and Habermann⁵ was the first to demonstrate giant cells and tubercle bacilli in the tympanic mucous membrane. Virchow, Toynbee, Zaufal and others contributed to the literature, and Politzer⁶ in 1865 defined the clinical peculiarities of tubercular ear disease. Schwartze⁷ in 1878 described the cheesy infiltration and tubercles of the mucous membrane, but not until 1882 was a definite histologic examination of middle ear tuberculosis made and described by Politzer,⁸ who has since collected many specimens demonstrating the destructive nature of the disease. It has been mostly in the last decade and a half, however, that tuberculous disease of the ear has gained its deserved importance and the literature on the subject accumulated.

FREQUENCY.

Brieger⁹ asserts that of those suffering from tuberculosis elsewhere in the body, about twenty-five per cent were affected by middle ear tuberculosis. Westmacotte¹⁰ found

*Thesis read before the meeting of the American Laryngological, Rhinological and Otological Society, Atlantic City, New Jersey. June 19, 1914.

two per cent of fifteen hundred school children in Manchester, England, suffering from tuberculosis of the middle ear. The disease is probably of far greater frequency than our statistics show, and the true diagnosis is often mistaken because its onset is so insidious that attention is not early called to the condition and no observation is made. Moreover, when the case presents itself the condition usually has passed from that of a pure tuberculous process and become a mixed infection, the symptoms of the suppurative condition masking the true nature of the initial disease. The careless manner of classifying all discharging ears as suppurative otitis media without recourse to the microscope or inoculation tests is unfortunate.

SYSTEMIC INFECTION.

The one essential factor for the development of tuberculosis is, of course, the tubercle bacillus, but there are many other etiologic elements that deserve brief mention. Heredity, for so long regarded as playing such an important rôle in the production of the disease, has been relegated to the background. Inherited tuberculosis does occur, but is extremely rare, and Ravenel says that there are but twenty-five well authenticated cases in the literature. That which may be inherited is a susceptibility and predisposition to infection by the tubercle bacillus, which being ubiquitous is most apt to gain a foothold.

MODE OF ENTRY.

Owing to the great frequency of pulmonary tuberculosis, it was long believed that the bacilli were simply inhaled with the inspired air and promptly found lodgment in the lungs. But facts, both clinical and experimental, are constantly accumulating, which prove that the digestive tract is an important, if not the most important, avenue of entry for the tubercle bacilli.

The tonsils may often be a portal of entry for the organism; whence, owing to the rich lymphatic supply, infection may spread to the bronchial and mediastinal glands, and thence to the lungs. A point which complicates the understanding of the portal of entry of the tubercle bacillus is

that the location of the primary lesion, on which so much stress has been laid, does not indicate with certainty the point of entrance of the invading organism.

The figures of Harbitz are as instructive as any to be found. In his report, based on one hundred and seventeen cases, he found:

	No. of Cases	Per Cent.
Primary involvement in respiratory tract.....	48	41
Primary involvement in digestive tract.....	26	22
Primary involvement in digestive or respiratory tract.....	24	20.5
General lymph node tuberculosis.....	11	9.4
Doubtful or other primary seat.....	8	6.8

Again, it must be emphasized that the location of the lesion does not indicate the portal of entry, and especially is this true in intestinal infection, as it has been shown by many that the mucous membranes of the various parts of the body can be penetrated by the tubercle bacillus without previous injury and without demonstrable lesion.

Calmette, from his studies, concludes that pulmonary tuberculosis, acquired at any age, may be due to recent intestinal infection. Schlossman and Engel have shown that when tubercle bacilli in milk or cream are injected into the stomachs of young guinea pigs through an incision in the abdominal wall, they reach the lung in a few hours, as proven by killing the animal and inoculating others with portions of the lung. Cases of human infection with bovine bacilli can be assumed to be of intestinal origin, as the chances for inhalation of bovine bacilli by human beings are extremely slight.

The results of work done with the object of establishing inhalation infection experimentally, such as causing dogs and guinea pigs to breathe air saturated with dried sputum containing tubercle bacilli, are open to the very grave objection that no attempt was made to close the esophagus, and it is certain that some of the bacillus-laden dust was swallowed. However, Findel, working with Fluegge, has infected dogs and a calf by blowing a spray of bovine bacilli into the trachea, which had previously been opened. At autopsy tuberculosis of the lungs was found, while the tonsils, cervical, retropharyngeal and mesenteric glands were free from the disease, both macro- and microscopically. In

addition, Nenninger has shown that when rabbits are forced to breathe air laden with the bacillus prodigiosus, cultures can be recovered from the finest bronchi. With these experimental facts at hand, the occurrence of inhalation infection cannot be gainsaid.

In general, then, it may be said that infection through the alimentary tract unquestionably occurs in a large proportion of cases. In children, especially, it occupies a position almost, if not quite, as important as respiratory infection. It must be understood, however, that the source of intestinal infection is not always food—dust, reaching the upper air passages, is often swallowed in the saliva and nasal secretion. The frequency, however, with which bovine tubercle bacilli have been found in children, show that their food is often responsible for the infection.*

The middle ear must be regarded as belonging anatomically and bacteriologically to the upper respiratory tract, as insisted upon by Goldstein,¹¹ who considers primary tuberculous infection of the middle ear of respiratory rather than of alimentary origin.

Quoting from Schenorl: "At the present time the general opinion seems to be that while the hematogenous and lymphogenous origin of instances of nonmiliary pulmonary tuberculosis cannot be denied, the disease, in the large majority of cases, originates from a primary, air-borne infection of the lungs."

ETIOLOGY.

Underlying conditions which act as predisposing factors to tuberculous infection exert an influence, remote or immediate, and acquire increased importance in the presence of the essential cause. Among the predisposing factors may be classed general debilitating diseases, the hereditary influence of tuberculosis, syphilis, association with tuberculous individuals, unhygienic environment, overcrowding, poor food, cachexiæ; in short, any condition of surroundings or constitution which induces a lowering of the systemic power to combat infection.

*The above taken largely from Ravenel, in Klebs' "Tuberculosis," pages 13 to 45.

Among predisposing causes of more immediate influence may be regarded:

First: Existence of a tuberculous lesion elsewhere in the body, especially pulmonary phthisis with cavitation, and tuberculous disease of the glandular and osseous systems; the former in adults, the latter in infants and children. It is noteworthy, in this connection, that tuberculous ear disease of adults where phthisis with cavity formation is present is usually primary in the middle ear; and in children, in whom gland and bone lesions predominate, primary involvement of the mastoid with secondary progress to middle ear is frequent. The emaciation and debility attendant upon advanced phthisis, and the recumbent position of the patient, all contribute to the difficulty of free removal of sputum from the eustachian vicinity and facilitate passage of minute particles into the eustachian canal. Ostmann¹² believes that the loss of fat around the lumen of the eustachian tube causes such an increase of its diameter that transmission of infection is rendered easy. Virchow considers tuberculous caries of temporal bone as secondary to tuberculosis elsewhere in the body.

Second: Abnormal conditions of the upper respiratory tract, including presence of nasopharyngeal adenoid growths, which have been shown by microscopic examination and inoculation tests to be the frequent seat of a latent tuberculosis. Of adenoids removed from otherwise healthy children the following were found showing evidence of latent tuberculosis: Dieulafoy,¹³ 20 per cent of thirty-five cases; Gottstein,¹⁴ 12 per cent of thirty-three cases; Brindle,¹⁵ 12 per cent of eight cases; Milligan,¹⁶ sixteen per cent of his cases. Inoculation tests gave the highest percentage of infection.

Nasal obstructions which interfere with the drainage and ventilation of the nasal fossæ and nasopharynx indirectly offer a predisposition.

Third: Infancy and childhood offer a predisposition for several reasons. Anatomic conditions and relations favor eustachian infection. The exanthemata and other infectious diseases are oftenest encountered in childhood. The frequency of adenoids and acute or chronic inflammation of other lymphoid structures in the throat, and the greater

susceptibility and relatively less resistance of childhood to infection, are all conditions favorable to infection should the opportunity occur. The embryonal character of the mucosa of the infant's eustachian tube and tympanum has been advanced as a cause for the easy establishment of a tuberculous lesion in the middle ear. The temporal bone of the child is soft and contains red marrow, which is not the case in the adult bone.

CHANNELS OF INFECTION.

The pathologic changes in the middle ear and temporal bone are directly excited by the presence of tubercle bacilli, which may be conveyed to the middle ear or its adnexa through the following channels:

1. Mechanically, through the eustachian tube; either airborne or introduced into the tympanic cavity by aid of particles of mucus or foreign matter during acts of swallowing, coughing, sneezing or blowing the nose.

2. Infection along the eustachian tube by other than mechanical means.

3. Through the blood channels.

4. Through the lymphatics.

5. Via the external auditory canal.

6. By extension of an intracranial infection through the internal auditory canal, fallopian canal or the labyrinth. This is mentioned merely as a possibility.

Mechanical conveyance of bacilli to the middle ear is not so improbable as superficial consideration might indicate. A review of certain facts in the anatomy of the *tubæ auditivæ* leads to an appreciation of the facility of this mode of invasion. In adults the eustachian tubes are from thirty-three to thirty-six millimeters in length, and converge downward, making an angle of thirty to forty degrees with the horizontal plane. The downward inclination occurs only in the cartilaginous portion of the tube. The height of the lumen of the tube at its pharyngeal orifice is nine millimeters, its width five millimeters, while at the tympanic end corresponding measurements are five and three millimeters.¹⁷ In infants the tube is much shorter, being less than twenty millimeters, and its lumen compara-

tively, and, as stated by Eitelberg, actually, greater in children than in adults. In children, too, the tympanic orifice is larger and on a lower level, and the pharyngeal opening much nearer to the choanæ and more in line with the respiratory air currents than in the adult. The ciliated lining of the eustachian tube tends to remove any extraneous material deposited upon it, but a forcible blast of air in a contrary direction may easily transfer the particle to the tympanic cavity. Milligan¹⁸ has suggested that movements of sucking, initiating to and fro currents of air along the eustachian tubes, favor transmission of infection. He¹⁹ also suggests the possibility of infection from regurgitated curds of tuberculous milk depositing bacilli in the pharynx, tonsil crypts and eustachian orifices. The mechanical mode of infection appears probable in late phthisis, when the emaciation of the tissues causes the tubes to approach the infantile type, becoming wider in lumen.

J. Horne²⁰ has shown that aural tuberculosis is a more frequent complication of phthisis with cavity formation than of any other type. The frequent cough, abundant bacilli-laden sputum, together with the altered tubal conditions, are favorable to the mechanical theory of infection. The fact that water entering the nasal chambers in swimming or diving, or during the use of the nasal douche, may find entrance to the middle ear, is familiar to all, and that bacilli in the upper respiratory tract may likewise gain entrance, is highly probable. That politzerization and catheterization carry mucus along the eustachian canal and often into the tympanum is demonstrated by the diagnostic tube. Snuff and smoke have been blown experimentally into the mastoid antrum.²¹ Habermann, Barnich, Cornet and Spira have observed instances of infection through the eustachian tubes.

To me the mechanical theory of infection, especially secondary, seems simplest, easiest and most probable in the great majority of cases; and it is suggested that the greatest number of cases occur in early childhood and advanced phthisis, when the conditions favorable to the mechanical passage of infectious material through the eustachian tube are at their maximum.

Not only may the eustachian tube transmit infection without becoming infected, but its lining mucous membrane may permit passage of bacilli into the lymphatic plexuses and subepithelial collections of lymphoid tissue around the lumen of the eustachian tube, without producing any lesion at the site of inoculation. After reaching the submucosa they may produce caseous lesion of the lymph gland, and later be carried to the middle ear, or reach the tympanum directly through the lymphatic vessels, or be carried in by leucocytes. Politzer favors the view that infection reaches the middle ear through the tubal submucosa, and Goldstein states that "over seventy per cent of the inflammatory and infectious processes which involve the ear have their origin in the pharyngeal and nasopharyngeal cavity."

Although the eustachian tube is a very infrequent localization of tuberculosis, the infection may reach the middle ear by extension of pharyngeal or nasal lupus by direct continuity.

Infection through blood channels from a focus more or less distant may localize itself primarily in cancellous spaces of the temporal bone, and invade the middle ear by extension of the process of infiltration and disintegration. Or infection may come from a preexistent, perhaps quiescent, lesion in bone or gland, or from ingested bacilli introduced into the circulation through the thoracic duct. Many observers regard the hematogenous the most frequent mode of infection in childhood. Henrici²² reports eight cases of tuberculosis of mastoid bone in children with no pulmonary lesion, and considers them to be of hematogenous origin. One case showed slight tuberculous infection of tonsils. He regards the blood path infection as the rule in childhood, and believes the primary involvement to be in the bone. Cases of hematogenous origin have been reported by Knapp,²³ Wilde,²⁴ and Hurd.²⁵ Barnich has shown that this method occurs when the distal infection is in the osseous or glandular system.

Lymphatic infection in this locality can occur only in a direction contrary to the lymph current. Such extension occurs elsewhere and is equally possible in this situation. The lymphatic drainage of this area has not been well worked out. Poirier and Cuneo²⁷ state that the lymphatics

of the cavum tympani empty into the retropharyngeal glands, which also receive drainage from the eustachian tubes. These glands also receive afferents from the upper part of the pharynx and the nasal fossæ. Efferent lymphatics run to the superior cervical glands along the internal jugular vein, draining regions peculiarly open to bacterial invasion, and offer a possible avenue of entry for aural infection.

Tuberculous infection through the external auditory canal is infrequent. Bacilli may gain entrance through a perforated membrane or through the tegumentary lining of the canal through an abrasion or without discoverable lesion. Lupus may involve the middle ear by a direct extension.

An intracranial origin of middle ear tuberculosis is improbable, and must be of extremely rare occurrence.

Spira recognizes a congenital origin of the disease.²⁸

PATHOLOGY.

Clinically two rather distinct forms of middle ear tuberculosis manifest themselves: the acute and the chronic. In each may be found all the changes from slight infiltration of the mucous membrane to extensive necrosis of the temporal bone. Rapid loss of tissue is characteristic of the acute form, resulting from ulceration of the tubercles throughout the mucosa. Habermann, Winkler and Brieger think that tuberculosis begins in the mucous membrane of the tympanum, especially on the promontory; Kuesta, in the antrum, while Bernstein holds that the membrana tympani is the site of the first lesion. In the membrana tympani the tubercles are first confined to the intima, and may be seen through the transparent membrane after undergoing caseation.¹⁶ The membrana propria, being more resistant to invasion, is not attacked until the intima is mostly destroyed. Its destruction is said to be due to a process of erosion rather than that of tubercle formation and caseation. Grimmer²⁹ found absorption or softening of the intima at isolated points through which the invasion extended to the dermal layer, thus accounting for the existence of multiple perforations.³⁰ S. Moss³⁰ found no true inflammation in the membrana propria. In the acute

form a grayish or yellowish gray point may occasionally be found in the inferior or posterosuperior quadrant, marking the site of first perforation. The membrane is of reddish hue, due to hyperemia, which gives way in parts about the umbo and below to an opaque nonvascular appearance, while the parts near the periphery throughout may show a raised or distended and rounded appearance of yellowish gray color, as if thickened by a greater infiltration than the central part. The greatest hyperemia is seen in the three-quarter arc anterior, superior and posterior, between the central white areas near the umbo and the outer circle above described. After perforation mixed infection causes modification of the condition, and rapid destruction of both soft parts and bone ensues.

In the chronic form the process runs an asthenic course, and infiltration, caseation and necrosis follow less rapidly and with more characteristic tuberculous sequence. Granulations are flabby, pale and anemic as compared with the vascular, reddish granulations of pyogenic infection. They may fill the cavum and protrude through a perforated membrana, or the external auditory canal may be occluded by them. The mastoid cells may be replaced with a mass of such granulation in which Milligan³¹ found giant cell formation, caseation and other characteristic tuberculous changes. In the chronic form, circumscribed miliary tubercles develop on the superficial membrane of the tympanum and undergo caseation and ulceration, with giant cell formation. Politzer and Brieger found destruction of mucous membrane of cavum exposing bare bone. Hartmann considers the typical place of first perforation the lower half of the membrana tympani; Buck,³² the upper posterior quadrant. Grimmer²⁹ found that advanced tuberculous changes may take place in the mucous membrane of the tympanum, or in the tympanic membrane itself, without producing visible evidence through the external auditory meatus.

Marked resistance is shown to the process of necrosis by the periosteum and dura, and often extensive destruction of bone is limited by these structures in seemingly normal state. The sheath of the facial nerve, as demonstrated by one of my cases (case 1), resisted the invasion of a very

extensive necrosis. The fallopian canal, also, on account of its density and perhaps its abundant blood supply, offers marked resistance to invasion. The frequency of facial paralysis in children may be due to the bone being softer than in adults, and to its incomplete ossification.

The ossicular chain is early attacked, and may be found in any stage of necrosis. Haiké³³ mentions caries of the footplate as being often present. Perforation of the fenestra ovale follows the destruction of the footplate, and with a similar condition in the fenestra rotunda the infection gains access to the labyrinth, causing marked deafness and vertigo. According to Milligan, perforation of the fenestra occurs in one-third of all cases.

Caries may attack the blood vessels, resulting in hemorrhage and thrombosis, as reported by Koessel. The petrosquamosal sinus is supposed to offer an avenue of infection from the middle ear, Cheate³⁴ reporting a case of miliary tuberculosis originating in this way.

Brieger says spread of the disease to the brain is not common, except in children, owing to fibrous tissue formation closing the lymph spaces.

Mastoiditis is a frequent complication. The mastoid process is often the site of a primary lesion.

Jobson Horne³⁵ believes that early glandular enlargement results from primary tuberculous middle ear disease, and is seldom found in secondary involvement. This has been the case in the author's experience. Why this should be true is not apparent. In a primary infection the proximal glands must constitute the line of defense between the focal infection and the rest of the body, and this duty is constantly performed. If the aural condition is secondary to a pulmonary or general tuberculosis, a systemic infection has already ensued, and there is no area of demarkation and consequently no line of defense. The mastoid and preauricular glands are first enlarged, and later the retropharyngeal and deep cervical. It has been demonstrated by Poirier and Cuneo²⁷ that the retropharyngeal glands receive afferent lymphatics from the middle ear and also from the pharynx, and since infection has been known to travel against the lymph stream, it is possible that the retropharyngeal gland infected from a diseased pharynx may

in turn convey infection to the middle ear. Conversely, it has been suggested that retropharyngeal abscesses may have resulted from tuberculosis of the ear.

Intracranial complications in tuberculosis of the ear are rare, compared to that of pyogenic otitis (Politzer, Jobson Horne). According to Mathews,³⁶ it is not infrequent. Macewen³⁷ reports ten cases of meningitis of tuberculous origin, five of which had intact membrana tympani, the internal auditory meatus being the avenue of infection in five of the cases. He reports one case resulting in miliary tuberculosis from infection through the lateral sinus. Intracranial abscess seldom complicates this disease, but may occur as the result of mixed infection gaining entrance through necrosed areas at tegmen tympani, about lateral sinus, or even through the internal auditory canal (Mathews³⁶). The necrosis may extend outward, causing Bezold's perforation and a subperiosteal abscess about the mastoid tip, or a gravitating abscess into the neck. Fistulous tracts near the mastoid may lead through the skin directly into a carionecrotic mass pervading the whole mastoid and labyrinth.

In primary cases, especially in children, the infection may pass through the eustachian tube and into the alimentary canal and cause a tuberculous enteritis.

SYMPTOMS.

In determining whether an otitis is tuberculous or not, we must first consider whether the patient shows symptoms in general of tuberculous disease; loss of weight and pyrexia being the most characteristic. In a primary tubercular otitis, emaciation would not be expected early, not until dissemination supervenes; but in secondary involvement the system is already toxic, and tissue waste in the majority of cases is considerable. Diarrhea often complicates the case and adds its quota to the wasting disease. Extreme dryness of the skin and an occasional rash may also occur.

In primary cases, and before pyogenic microorganisms are superimposed, the temperature may, on account of the asthenic condition, remain low, being atypical of the pyrexia characteristic of a systemic tuberculous condition.

But if the chart be watched carefully the simulation of the typical swaying temperature will sooner or later manifest itself. Mixed infection may at any stage of the disease modify the expected rhythm and immediately cause a pyrexia not at all unlike that of a fulminating otitis of pyogenic origin. The distinction between the acute and chronic forms of the disease is probably a matter of associated pyogenic infection in the former. In my opinion every uncomplicated case, either primary or secondary (unless of miliary type), would present symptoms of the chronic type. In each type absence of pain is the essential symptom differentiating it from otitis of other genesis. Even though the destructive process is rapid and the appearance of the membrana per se simulates an acute purulent otitis, there is seldom any complaint of pain. In case 5, where in four days the lower half of the membrane was destroyed, there was entire absence of pain. As long as the condition remains characteristically tuberculous and the ravages of pyogenic microorganisms are absent, the process is painless. Pritchard suggested that the early perforation of the membrana tympani relieving the tension of the cavum accounted for the lack of pain, but, as shown by Macewen's³⁷ cases, five resulted in intracranial complication without rupture of the membrana, and no doubt had a painless beginning. It is also to be remembered that the membrane does not perforate early. It has been suggested that in the breaking up of the bacilli into wax and alcohol, the alcohol liberated into the tissues produces an anesthetic effect. We do know that tuberculous lesions in general are fortunately painless, and tuberculous otitis is no exception.

In the acute form a view of the membrana tympani shows, at first, little to differentiate the condition from a myringitis of nontubercular etiology. There are, however, usually two points characteristic. Seldom is the hyperemia uniform over the membrane, nor is it confined along the manubrium and Schrapnell's membrane, as is often observed in the other otites, but, on the contrary, there exist clearly circumscribed areas of paleness and opaqueness, whose location is at variance from what would be expected from the anatomic distribution of the blood vessels. This pale area is most often found in the lower part of the mem-

brane, including the tip and lower third of the manubrium, and extends near but not quite to the periphery. Accordingly, a second small area (and at times the only area) is immediately posterior to the short process. These areas remain pale, become thicker, as does the membrane throughout, and are invariably the points of first perforation, the destructive process being limited at first closely to the margins of what constituted the pale area. In no other condition have I found this marked contrast and, to me, typical appearance of the tympanic membrane. These areas appear flatter than the hyperemic adjacent parts, which latter are seemingly distended, as is a membrana in acute purulent otitis with pressure. The other characteristic condition, always present, which can be perceived, is the thickening; and the amount of thickening is in direct proportion to the acuteness of the condition in acute and to the duration in chronic cases. In case 5 a large perforation occurred, corresponding to the previous pale area, during an act of sneezing, when a hissing noise in the ear was accompanied with a slight aural discharge.

There is nothing characteristic of the discharge, save the presence of the tubercle bacillus, occasionally found; and some observers believe that their presence does not in itself absolutely prove the existence of the disease. At first watery and inoffensive, occasionally blood stained, the discharge soon becomes thick or thin, copious or scant and offensive, according to the progress of the disease, whether a pyogenic infection intervenes, and whether a caseonecrotic process is present. Spicules of bone (as in case 1), sequestra and ossicles may be found in the discharge.

Granulations may appear at the point of perforation in chronic cases, and remain there, flabby and pale, blocking the exit of the discharge. They may even fill the tympanum or protrude through a large perforation, partly or completely filling the external auditory canal (as in cases 1 and 2). Microscopic examination of these granulations may reveal tubercle, giant and epitheloid cells, caseation and tubercle bacilli (Milligan).

Carious areas may be felt on the inner tympanic wall or in the ossicles early in the disease. It is believed by some that the process begins in the bone, that tuberculosis of the

ear is essentially a bone tuberculosis, and usually a part of a general condition. Often a probe can be passed backward through a perforation of the posterior canal wall into the mastoid. In case 1 a fistulous opening in the posterior canal wall in each ear led into the mastoid, which was filled with granulation. No resistance may be felt as the probe enters the soft caseous mass replacing the labyrinth, or the pars mastoidea and labyrinth may form one or more large sequestræ. Fistulous opening near the mastoid tip may occur in chronic cases.

Facial paralysis is frequently observed in primary cases and in children, and less frequently in secondary involvement and in adults. It may be suddenly complete, but usually is partial at first, affecting areas supplied by certain fibers.

DIAGNOSIS.

In determining the diagnosis, the family history should be carefully considered with regard to tuberculosis, and the patient's habits, residence and environment should be ascertained to determine whether he has been unduly exposed to tuberculous persons, or unhygienic surroundings. Case 2 lived with parents, both of whom were tuberculous, and since dead of the disease. Case 3 had a tuberculous mother, since dead of pulmonary tuberculosis. The matter of environment plays an important part, especially in children. In the adult the personal history is, perhaps, of equal importance, and whether the subject had, at this time, or has had (now latent) pulmonary or other tuberculous lesions. Cases 4 and 5 had phthisis pulmonalis in active state. Much coughing predisposes to the affection by mechanically infecting the pharynx and eustachian tube with sputum. The absence of pain, as noted in the symptomatology, the loss of hearing, sometimes complete, and the rapid invasion of the disease, are pathognomonic of otitic tuberculosis. It is stated that sarcoma of the ear is also painless.

Facial paralysis, especially in children, occurs in one-third of the cases, against one to two per cent in non-tubercular conditions. It is of special diagnostic significance.

While the copiousness of the discharge may not differ

from that of other suppurative conditions, its sanious and foul condition excites suspicion, and especially when particles of bone (as in case 1) are incorporated. Gaudin attaches importance to the character of the granulations.

Marked impairment of hearing, absence of headache and occurrence of hemorrhage are diagnostic points mentioned by Horne. Politzer³⁸ emphasizes the rapid destruction of the membrane and early caries, while Haike³⁹ attaches much importance to necrosis of the footplate of the stapes.

Brieger⁴⁰ considers tuberculin injections as a valuable aid to diagnosis, especially in chronic cases. In one of his cases the reactive swelling was so great as to cause facial paralysis, the previously pale tympanic mucosa became infiltrated, and the previously negative examination of discharge showed numerous tubercle bacilli.

Recent investigations of the blood pressure in tuberculosis tend to show that a condition of hypotension exists continuously in the pretubercular state (Faught⁴¹).

The only positive means of diagnosis are:

1. Finding microscopically in the discharge or granulation the tubercle bacillus; or
2. Giant and epithelioid cells and caseation in the tissue.
3. By experimental inoculation reproducing tuberculosis.

The bacillus tuberculosis can be found in about fifty per cent of the cases. It is difficult to find after pyogenic bacteria gain access and increased putrefactive changes have occurred. Gruber, Politzer and Bernstein do not consider presence of tubercle bacilli in aural discharge as absolute proof of tuberculous infection, while Gottstein, Koenig and Marschand think that failure to find tubercle bacilli is of little diagnostic importance. Siebenmann and Milligan use inoculation tests in diagnosis, while Brieger considers microscopic examination of tissues reliable. We should not forget that nontuberculous infection may, and often does, occur in subjects suffering from pulmonary or other tuberculous lesions. Every suspected case should be examined, however, in order that, in primary cases especially, an early diagnosis may be made, and appropriate treatment, hygienic, therapeutic or surgical, be instituted.

Much has been written concerning the differentiation between the tubercle and other acid-fast bacilli which simu-

late it. It is true that the average observer cannot with the means usually at hand in his laboratory make the distinction. The bacillus smegmæ, bacillus subtilis, bacillus butyricus are among these, but their occurrence is so unlikely that they are negligible; at any rate, it is safe to consider any case showing an acid-fast bacillus as true tuberculosis, and treat accordingly until the contrary is proven.

PROGNOSIS.

The prognosis of middle ear tuberculosis is, as a rule, unfavorable. It is so because usually it is a complication of a general tuberculosis, the prognosis of which is unfavorable; or it is a primary process in an infant illy nourished, marasmic, syphilitic or tuberculous, which conditions themselves, without an otitic focus, may threaten the child's life. The middle ear process, per se, is not so unfavorable as has been pictured, unless advanced or miliary tuberculosis of lungs or other organs militate against the repair of the secondary complication. Crockett⁴² considers the prognosis of tuberculous otitis in infants as favorable as of ordinary septic infections. The prognosis is unfavorable in acute cases, especially in advanced pulmonary tuberculosis, and as a rule marks the beginning of the end. It is unfavorable if the symptoms of labyrinthine involvement or facial paralysis are present. It is favorable when arising in cases of chronic pulmonary tuberculosis, and especially when of a chronic type. In such cases the condition of the ear is as a barometer, indicating by its exacerbations the activity in the lung or other affected organ. The otitic condition will, as a rule, improve or not as the general condition improves or grows worse; and this suggests that in chronic cases the treatment is essentially that of the general condition—hygienic, dietetic, medical and surgical, as the case indicates.

TREATMENT.

The treatment naturally divides itself as above enumerated. For the lack of space the hygienic and dietetic, although of vast importance, will not be considered; nor will the internal treatment, except the use of tuberculin, be given.

USE OF TUBERCULIN.

The use of tuberculin has proven so successful in so many forms of tuberculosis that no tuberculous process in any way localized can be considered invariably to contraindicate its use.

The question of tuberculin therapy is such a broad one that its mention here must be confined practically to generalities. The choice of the particular member of the tuberculin family (now numbering about seventy varieties) is of less importance than familiarity on the part of the administrator with the product he is using. Theoretically, Bacillen emulsion (B. E.) should confer a greater amount of antitoxic immunity, and old tuberculin (O. T.) and bouillon filtrate (B. F.) a greater amount of antibacterial immunity (Ringer⁴³). Practically the same end result can be reached with any of these products of the tubercle bacillus. The object in giving tuberculin is, of course, the stimulation of the natural specific resisting forces of the body toward the production of an active type of immunity to the tubercle bacillus and its toxins.

As to the advisability of using tuberculin in tuberculous middle ear disease, so great an authority as Politzer dismisses the matter with the curt sentence: "Injections of tuberculin have proven worthless." The writer can see no reason why it should not be indicated and of decided value in properly selected cases. It should, of course, not be used in acute fulminating cases, for here the body is already overburdened with toxins, and the reactive forces are exhausted beyond the power of stimulation by tuberculin. We know, however, that the tuberculous process is practically the same wherever situated; we have all seen brilliant results obtained by the use of tuberculin in tuberculous laryngitis, lupus, testicular tuberculosis, tuberculous adenitis and bone and joint tuberculosis, to say nothing of the vast army of pulmonary cases whose lives have been prolonged and health restored, partly by the aid of tuberculin. With these indisputable facts before us, why exclude tuberculosis of the middle ear from the category of those affections that tuberculin can and does aid?

One of the great obstacles to our gaining a knowledge of the beneficial effects of tuberculin in tuberculous otitis

media lies in the fact that as a primary condition it is relatively rare, so that we are usually face to face with a tuberculous process antedating the middle ear involvement. Furthermore, this tuberculous process may be of such a nature or in such a stage as to contraindicate the use of tuberculin. The fundamental proposition, however, holds true, that tuberculin, if it be of aid in any given case, is of aid in the most rational and satisfactory manner, by striking specifically at the cause of the trouble, and by producing the most lasting results in stimulating and enhancing the natural immunizing forces of the organism.

Practically no details as to dosage and method of administration can be given in an article of this scope, for almost every physician experienced in the use of tuberculin (and the remedy is not one to be used freely by the inexperienced) has his own preference for the particular product used, the frequency of dosage and the scale of increase. As stated above, the particular tuberculin employed is of no great importance. What is, in the writer's opinion, the most important element in tuberculin therapy, is the correlation of the size of the dose and the tolerance of the patient. These two elements can never be dissociated, and their interdependence disposes at once of any attempt to give tuberculin by rule of thumb. Any tyro can diagnose a violent systemic tuberculin reaction with its chill, fever, malaise, and increase in all preexisting symptoms, to say nothing of the appearance of new ones; but any tyro is not qualified to administer tuberculin. Local reactions at the site of injection are easy to diagnose—the brawny redness and more or less extensive infiltration being pathognomonic objective signs, while the pain, discomfort and complaints of the patient are insistent and convincing subjective incidents. Both of the preceding types of reactions are, however, easier to diagnose, of less frequent occurrence, and also of lesser importance than the focal reaction, which is a clinical expression of the specific action of tuberculin upon the focus of disease. The focal reaction should be the more carefully studied and the more familiar to the physician in those lesions of tuberculosis that offer themselves to direct inspection, such as lupus, the larynx, and the ear. Slight changes in local appearances, a slight swelling, in-

creased congestion, whether or not united to subjective local sensations (increased pain or deafness), or objective symptoms (increased discharge), should warn the administrator of tuberculin that he is nearing the limit of his patient's tolerance. This limit it is most desirable to reach, but most dangerous to overstep, for it is in the overstepping that harm—sometimes temporary, sometimes irreparable—may be done. It should ever be borne in mind that the size of the dose divorced from the tolerance of the patient is of absolutely no value, and that apparently minimal doses in patients highly sensitive to tuberculin are of just as much therapeutic benefit as are massive doses in other patients possessing relative tuberculin insusceptibility. Haste has no place in tuberculin therapy, and to haste—to the desire to “get to big doses”—is ascribable much of the odium that has been vented upon this important remedial agent.

The duration of tuberculin treatment is as yet a knotty and unsettled point. It is the general consensus of opinion that no course of tuberculin will prove of lasting benefit that does not extend over several months. There are, for the various preparations, arbitrary maximal doses which should not be surpassed. Very few patients, however, ever reach these doses. In health resorts the patient's departure for home too often determines prematurely the cessation of tuberculin. Where time plays no part, one should be guided by the condition of the local lesion and the tolerance of the patient. If the local condition be satisfactory, and the patient exhibits signs of intolerance to a given dose, it is well to drop slightly down the scale and to repeat the amount decided upon several times. If upon increase intolerance is again evident, a cessation of tuberculin for a few months is desirable. Supplementary courses of tuberculin are to be counseled, even in the absence of any recrudescence of the disease, as a prophylactic measure. Such courses should be given not more frequently than every six months, and not more infrequently than every eight months. They can be gone through with more rapidity than the initial course, as the previous tolerance of the patient is already known, and they serve to preserve and to heighten the degree of immunity to tuberculosis.

SURGICAL.

The membrana tympani in any case of tuberculosis of the middle ear should be incised early. This should not be delayed until perforation occurs (as in case 5, in which the lower half of the membrane sloughed away during a night). The incision should be through the portion showing the greatest infiltration, usually the pale, opaque area found below or posteriorly. It should be done for the sake of drainage of the middle ear, for the relief of the infiltration of the membrana itself, and for ventilation. The condition of the eustachian tube is invariably relieved after perforation or incision of the membrane, as is the middle ear, and we are imitating nature's method when we incise early. In this case the usual symptoms of bulging and tension are wanting, and if we wait for these, the membrana may melt away between office visits, leaving a larger perforation than remains after incision. After ample paracentesis the eustachian tube and middle ear should receive the same toilette as is indicated in nontuberculous conditions, the dry wick often replaced being indicated. Of local remedies, iodoform and iodine derivatives have given best results. The use of sunlight directed by the reflection from a concave head mirror on the tympanic membrane for five or ten minutes each day has seemingly been of benefit in certain chronic cases, and I would strongly advise its use where the local process appears to be confined to the membrane. With hygienic, dietetic and tuberculin treatment increase the opsonic index to the point of tissue resistance, with the hope of limiting the process to the tympanum proper. If the process continues to the mastoid or labyrinth, as evidenced by the symptoms, lose no time in resorting to whatever surgical interference is indicated for a thorough eradication of the invaded tissue.

Care should be exercised in the choice of an anesthetic and an anesthetist, in case of pulmonary involvement, or of other marasmic condition, and to the same end the operation should be concluded with the greatest expedition in keeping with thoroughness and safety.

In the after-treatment the general condition should receive the careful attention of one accustomed to handling tuberculous cases, especially the hygienic and dietetic care.

Outdoor advantages should be had as soon as possible, and every available means used to combat the general infection and establish a resistance against the disease.

REPORT OF CASES.

The following five cases are reported, not because they are singular in nature or present any new features, but as representing some of the types of aural tuberculosis commonly seen. They are chosen from cases which fortunately are still living, and consequently the postmortem findings, always of interest to the student of pathology, cannot be given. The diagnosis in these cases was made clinically and with the microscope, none of the tissues having been used for inoculation to confirm the findings.

Case 1.—J. B. B.; born in 1884, aged twenty-four years; male. No family history of tuberculosis. Patient had, in childhood, measles and chickenpox. Pneumonia at twelve years. In 1904, during an attack of 'grippe, had pain in left ear, followed by discharge, with rapid loss of hearing. In 1905 the right ear began to discharge, without pain, and with rapid loss of hearing. Discharge and deafness were first symptoms observed. Both ears continued to discharge, and deafness to increase until February, 1908, when patient first consulted me.

Examination of left ear revealed foul smelling discharge, containing gritty debris and particles of bone, membrana tympani absent, granulations in tympanum, and perforation in posterior wall of canal leading into mastoid cavity containing necrosed bone. Right ear in similar condition, excepting the perforation of posterior canal wall. Operation on left ear exposed large mass of flabby pale, granulation tissue, with here and there large sequestra replacing mastoid cells. Necrosis had involved the facial canal, and the facial nerve lay in this mass of debris, protected only by its sheath. Chest examination at this time was negative, as was sputum examination, made two months previous. In May, 1908, the right ear had become worse, the posterior canal wall having likewise perforated. Operation revealed the same conditions as found in the left ear, with added extension of necrosis into the labyrinth. This ear also recovered. Both ears remain well up to the present

time, excepting the need for occasional attention on account of the eustachian tubes remaining patent. At time of second operation the lungs showed evidence of involvement, which progressed to cavitation, but, notwithstanding, the patient has recovered, and is earning a good salary in a bank, where he has served since 1909. He has enough hearing in the left ear to enable him to dispense with artificial aid to hearing. After the lung condition became manifest he received tuberculin treatment for some time.

Case 2.—M. S.; female; aged twelve years. Mother died of tuberculosis when patient was nine months old. Patient was breast fed first three months. Father developed pulmonary tuberculosis when child was one year old, and died of the same. When patient was three years old swelling over the left mastoid occurred, without pain, discharge or any symptom calling attention to the ear. The mastoid swelling was incised, leaving a sinus through the cortex, filled with pale granulations and discharge. The sinus was curetted several times. At four years of age the mastoid was opened, but failed to heal. One year later another surgeon operated, removing granulation tissue and necrosed bone. The wound again failed to heal, and discharge persisted for the next seven years through an opening the size of a dime resulting from the previous operations.

In 1907, at the age of twelve, when patient was first seen, there were present foul smelling discharge and masses of pale granulations in the tympanum and projecting from the posterior opening, through which bare bone could be felt. Operation in 1907 showed the entire mastoid cavity, zygomatic cells and the labyrinth to the apex of petrous bone filled with granulation tissue and sequestra, containing typical cheesy masses, giant and epithelioid cells. Everything was curetted away down to the internal table, and after cauterization of the bony wound with phenol and alcohol the wound healed kindly. In June, 1911, discharge from the ear recurred and a large cholesteatoma was removed from the mastoid area. Since this time the ear has remained well and the patient in good health, showing no evidence of tuberculosis elsewhere in the system.

Case 3.—G. W.; colored, female; aged four years. Mother had pulmonary tuberculosis when child was born,

and since died of the disease. Child was well until one month ago, when she began to have fever, discharge from left ear, tenderness and swelling, but no pain over the mastoid. Operation in November, 1907, revealed the mastoid process filled with granulations, showing typical tuberculous changes on microscopic examination. The mastoid wound healed satisfactorily, but discharge from the ear has continued to the present time. In 1911 the tonsils and adenoid were removed with but little benefit to the ear or general condition, which latter remains below par, notwithstanding the absence of definite evidences of tuberculosis.

Case 4.—E. E. S.; aged thirty-five years; musician. Pulmonary tuberculosis in chronic form for fifteen years. Last six months has had slight activity, but not sufficiently severe to interfere with vocation. Two months ago noticed feeling of fullness and impairment of hearing of right ear, continuing to progress steadily and without pain or other discomfort.

Two weeks later, at first visit, bone conduction was intact, but there was considerable interference of air conduction in lower scale. The usual landmarks of manubrium, light reflex, etc., were obscured by the infiltration present. The slight hyperemia over the posterosuperior quadrant soon subsided, leaving the membrane uniformly nonvascular and thickened in appearance. Sunlight directed on the membrane each day with concave head mirror has been the only treatment except tuberculin, which was begun at the onset of the aural complication. The hearing is gradually improving, as are the objective symptoms.

Case 5.—G. P.; male; aged twenty-four years; no family history of tuberculosis. Engaged in athletics at college, and soon after graduation (two years ago) symptoms of pulmonary tuberculosis developed, which have continued in subacute form ever since. Has resided in sanitarium most of last year, and had less than one degree of temperature during past six months. State of nutrition good, and general condition is apparently excellent.

Consultation one month ago gave history of a feeling of fullness and sudden deafness of right ear two days previously, but no pain, vertigo, or tinnitus. Examination re-

vealed a membrane considerably distended in the postero-superior quadrant, which was highly injected; the lower half being flat, anemic, and containing no visible blood vessels. The membrane throughout was greatly infiltrated, and the upper distended hyperemic area and the lower flat pale area were clearly defined. Near the periphery, all around, there was apparently greater infiltration of the membrane, giving it a distended and yet slightly transparent appearance. But at the next visit, four days later, he stated that on the night before, he had, during an act of sneezing, noticed a hissing sound in the ear, and afterwards a discharge. Examination showed the lower third of membrane sloughed away, a watery discharge, and a pseudomembranous coating, extending over the dermal layer of remaining portion of membrane and on to the adjacent canal wall. There had been no pain from the beginning, although the process had been very acute. Four days later the condition about the same, except slightly more discharge, destruction of membrane remaining the same, and corresponding to the anemic area observed at first visit. Tuberculin treatment was begun after perforation occurred, but a slight reaction followed a dose of 0.00001 gram, indicating a high degree of toxemia. A few days later he was able to take smaller doses without reaction, and the activity is seemingly subsiding.

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XLIII.

AURAL COMPLICATIONS IN TYPHOID FEVER.*

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Twenty years ago I studied the ears in 234 patients ill with typhoid fever at the Boston City Hospital, and seventeen years ago I presented a paper at the annual meeting of the Massachusetts Medical Society, giving the results of these investigations. Although I have never been able to study the ears in so large a number of typhoid patients as a group since that time, having served as an aural surgeon to a large general hospital, I have been called upon to examine many patients who had developed aural disease during an attack of typhoid or who suffered with a pre-existing pathologic condition of the ear, which was aggravated by the typhoidal condition. There have also been many cases presenting typhoid symptoms and signs which proved to be due to complicated aural sepsis and not to typhoid bacillus.

In considering the subject, we have to deal with the aural complications which may develop during the course of the typhoid infection, those which have existed before the onset of the typhoid condition, and those cases of aural disease which, through extension into the lateral sinus or brain, may simulate in many ways the symptoms of the typhoid state when there is no typhoid infection present. This latter class is a very important one, both because of its extreme severity and high mortality, and because early recognition and skillful surgical interference can often save the life and enable a restoration to comparative health of those almost surely doomed to death if left to nature or to unaided medical treatment. It is quite generally known

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that during an attack of typhoid fever there are inflammatory conditions within the ear liable to develop; that there is often a state of deafness more marked than the aural signs or the mental depression would account for, and that these cases are liable to be refractory, due to the lowered state of the patients' vitality.

The time allowed for the presentation of this subject is not sufficient to consider the various aural complications at all thoroughly, therefore the main purpose of this paper is again to impress upon the physician who is responsible for the care of a typhoid patient the great importance of not forgetting the liability of aural complications in this disease, and of their seriously affecting the progress of the case. It is fully as important to remember that a grave aural complication may be the one and only causative agent in producing a symptom complex which may so closely resemble a true typhoid infection as for a time to deceive the skillful clinician unless he pay strict attention to the ear and its associated organs, the lateral sinus and the jugular vein. A patient may have had a typhoid infection and have presented all of the signs of that disease, and during the height or at the later convalescence of this disease may develop a purulent lateral sinus and jugular thrombosis, with all of the dangers of these complications. Not only is lateral sinus thrombosis frequently mistaken for typhoid fever, but it is a comparatively frequent complication of this disease, and probably no complication has been so frequently overlooked. There is good reason why this condition can so frequently escape the attention of the clinician. One is that the great majority of these patients are extremely ill and are very much depressed mentally as well as physically. They are often too ill at first introduction to the physician to be able to give a clear history of the onset of the disease or of their past ailments, and frequently the friends know comparatively little about the previous physical condition of the patient. This is especially true in regard to a previous aural disease which may have been comparatively slight and of short duration. There are many who have had a low type of middle ear for years who scarcely pay attention to this aural condition, and there are some who even are not aware that such

trouble exists. Again, there are a few who may have an infection within the ear extending into the mastoid and to the lateral sinus without producing the usual symptoms of middle ear disease, and without leaving any signs in the drum membrane of any disease. One of the cases reported at this time belongs to this class, and the condition was diagnosed by the thickened feel of the jugular and the septic temperature chart. Many of these cases could go to autopsy, and unless especial attention were paid to the lateral sinus and jugular, the true cause of death might remain unknown. This is especially true in cases where permission to open the head cannot be obtained and the lateral sinus cannot be examined.

One of the most important considerations in this condition is the diagnosis, for if a positive diagnosis can be made there is no serious question as regards treatment. An operation to tie the jugular vein and open the lateral sinus is imperative and immediately necessary, and today every aurist is familiar with the technic and should possess the skill to thoroughly cope with this condition. It is unfortunately not always possible to make an absolute positive diagnosis in this condition. It is especially hard in many of the cases which complicate a true typhoidal condition or which develop shortly after the extension of a typhoidal infection, for there are so many conditions complicating typhoid as well as the proneness of this infection to the so-called relapses which may give increased temperature and other signs of sepsis. If there are signs of middle ear infection or mastoid extension, and we have had symptoms of pain and tenderness about the ear, or if there is tenderness of the carotid sheath associated with a septic temperature, with or without chills, a diagnosis can reasonably be made; but when we have chills and accompanying temperature without pain, without a history or signs of a middle ear inflammation, and when a blood count shows only 11,000 whites, and when there is no jugular tenderness and there are no mental or ophthalmic signs suggestive of septic thrombosis, we have to consider and eliminate if possible the other frequent complications of typhoid before giving too much weight to the probability of septic lateral sinus thrombosis. In fact, it is almost as serious a blunder to be

misled and operate upon a healthy mastoid and lateral sinus in a patient suffering from some other complication of typhoid fever, as it is to overlook and not operate upon a septic sinus thrombosis. There is one very positive and valuable diagnostic sign which is often present when sinus infection has extended into the jugular. There is a phlebitis which shows a distinct change to careful palpation. In order to obtain the best results in palpation of the jugular it is necessary to have the neck muscles, especially the sternocleido muscle, as lax as possible, and the sheath of the large vessels must be palpated with delicacy and care. It is always advisable to carefully compare the jugular veins of the two sides, and yet to not forget that in health there is sometimes some variation. If the patient is not too apathetic, this careful palpation will often demonstrate a hypersensitiveness of the jugular sheath. This sign, if present, is a very valuable one; but its absence does not in the least eliminate the possibility of a septic sinus or perhaps even of a jugular phlebitis. We must also, if possible, be quite sure that the tenderness is in the jugular sheath and not in the cervical glands, for the superior deep cervical glands are often infected and sensitive when there is a simple middle ear, eustachian tube, or epipharyngeal infection.

Much has been written concerning leucocytosis, but in these cases it has been of little help. In one of our severe cases we had 11,000, and in another about 18,000. A marked polynuclear leucocytosis, when present, would add to the positiveness of our diagnosis in cases where other signs are vague or absent. It is of considerable importance not to place too much weight upon the blood findings, either positive or negative, though they may be of help when considered with other signs. Frequently the patient is not seen until the condition is well advanced. This is especially true of hospital cases, as many cases are treated at home or have no treatment until they are becoming very severe, when they are referred to or seek aid at a general hospital. We may have at these late stages any number of complications. There may be meningeal extension with the associated headache, and perhaps eye symptoms. There are also frequently foci of metastatic infection.

These may occur in the lung, spleen, heart, liver, joints or in the brain, and the symptoms and signs will be such as occur when any of these various organs become affected. These symptoms may be more prominent than those arising from the primary disease. It is the late complicated cases which are so liable to be diagnosed as typhoid fever. Typhoid patients are also very liable to develop aural disease or have exacerbations of preexisting aural disease during the course of the typhoid. These cases having a positive Widal and other positive symptoms and signs of typhoid, often complicate and add to our difficulties in making a positive diagnosis of any coexistent aural complications. It is not rare to find not only a septic thrombosis, but frequently so long a time has passed since the onset of the sinus complication that the thrombus has been broken down and the sinus become filled with a necrotic purulent mass, which only a small distal clot within the jugular may prevent from entering the circulation. The liability of this condition makes it important to first tie the jugular beyond the thrombus, if possible, before attacking the sinus within the cranium. The possibility of this grave condition complicating a typhoid infection makes it extremely important to carefully watch the ears during an attack of this disease, and especial attention should be given to this subject whenever any unaccountable symptoms of sepsis arise. We as otologists are rarely called to these cases at first, nor are they usually admitted to our aural clinics or special hospitals. The family physician and the general medical hospitals first meet the great majority of them. It is our duty to not only impress the importance of this subject upon the general practitioner, but to become as proficient as we possibly can in caring for them when called in consultation, either in private or in general hospitals. With all the knowledge and care at our present command there will be some cases so obscure and complicated that we shall fail in our diagnosis, and in this failure must blunder in operating or in waiting. It is a grave responsibility, and any work which can add to our knowledge will be of the utmost importance.

From October 1, 1913, to February 1, 1914, I was able to diagnosticate and operate upon five cases of septic sinus throm-

bosis at the Boston City Hospital in patients who were admitted as probably typhoid. Although these cases showed many symptoms of typhoid fever they were not typical, and the physician in charge called me in consultation for an aural examination. The Widal test was negative in four cases, and the three hour temperature chart, carried for several days, suggested septic absorption in all of them. There were signs of beginning choked discs in two of these cases.

R. C., a man thirty-four years of age, of powerful physique, was admitted to second medical service at the Boston City Hospital, October 19, 1913. He had contracted chancre fourteen years previously, and had an abscess in the right ear in July, 1913. Since July frequent attacks of headache, and three weeks before admittance a severe chill. Severe headache and fever off and on for three weeks, some abdominal pains and soreness, and slight hacking cough for over a week. There had been dyspnea for a week and vomiting for three days. Physical examination showed eyes, throat, heart and lungs to be normal. The bowels were lax and tympanitic. The reflexes were normal and there was no Babinski or Oppenheim. The blood count showed 20,000 white, and a culture of staphylococcus pyogenes was obtained. On October 22d, in consultation, the right ear showed much foul pus. The membrane and part of the handle of the malleus were gone. There was tenderness in the digastric fossa, and the jugular was distinctly thickened. There was some retinal stasis. The pupils were normal. The left shoulder and right knee were tender and somewhat swollen. Immediate operation was performed. The jugular was filled with thrombus, and it was necessary to tie below the facial vein. The lateral sinus was filled with suppurating clot to nearly the torcular. Following the operation the local condition progressed favorably, but there were several septic joints and two attacks of facial erysipelas. He was not able to be discharged from the hospital until November 30th. He has been perfectly well since.

A. H., a girl thirteen years of age, was admitted to the third medical service November 28, 1913. She had suffered with rheumatism when five years old. Was fairly

well till fourteen days before admission, when she had a severe cold. There were pains all over body, especially in back. At first there was earache. Had pain about heart and loss of appetite. She was apathetic. The tongue was dry and heavily coated. The teeth were covered with sordes. There was a systolic murmur, and the apex was in nipple line. The other organs were normal. The reflexes were normal. The blood culture was negative, and the white blood count was 22,000. An examination showed the ear to be apparently normal. The mastoid was slightly tender. The jugular was distinctly thickened. I operated November 20th. The jugular was filled with thrombus, and a low tie was necessary. The mastoid was filled with granulation tissue. The sinus was thrombosed to near tricular. After the operation the symptoms were much relieved for five days, when symptoms of general meningitis developed. Decompression relieved for forty-eight hours, when she grew suddenly worse and died.

N. E., an Italian, thirty-six years old, was admitted to first medical service December 5, 1913. As far as known he had never been ill until two weeks previously. He began with headache, frontal and occipital. There was at first slight earache. He was much prostrated. The abdomen was tympanitic. The white count was 41,000. There was rigidity of neck, the right ear was discharging pus, the anterior inferior quadrant of membrane was gone. The jugular was normal to palpation. There was a slight Kernig, increased knee jerk, and Babinski both sides. The white count in spinal fluid was 300 per millimeter. A mastoid operation showed the whole bone filled with granulation and pus. The lateral sinus was exposed and found to be thrombosed. The jugular was tied and the sinus and bulb cleaned out. There was hypertension of the dura. There was relief for four days following operation, when the symptoms of meningitis returned and the patient died seven days after the operation.

B. B., a printer by trade, admitted to hospital December 4, 1913. He had been ailing for several weeks and treated for typhoid. There had been severe headache and stiff neck. The day before admission there had been three chills. Examination showed normal reflexes, negative Widal,

blood count 14,000, and a general septic appearance. There was tenderness over left mastoid tip and fluctuation below tip. The jugular was infiltrated. The membrane was red and bulging. There was sagging of posterior wall. An operation was performed and the mastoid found filled with pus and granulation tissue. The sinus was thrombosed and the dura much inflamed and bathed in pus. The case seemed hopeless and the chances were that there was a general purulent meningitis. The patient died six days later.

Miss V. P., admitted November 14, 1913, complaining of blurred vision, weakness, headache, loss of appetite, nausea and vomiting, chilly sensation, prostration. When a baby had abscess in right ear. When fifteen years of age the same ear again discharged for a while. The case was diagnosed as typhoid and sent to the hospital. Physical examination showed considerable emaciation. The heart and lungs were normal. The bowels were tympanitic. The white count was 20,000. The patient continued with many typhoidal symptoms, but there was no Widal and there were no typhoid bacilli in the stools. I examined patient December 10th, and found a chronic suppurating right ear. There was a spontaneous nystagmus to the left. Pressure on tragus increased this and produced marked vertigo. The jugular was distinctly thickened. The following day the jugular was tied, the mastoid was cleared, and the outer wall of the horizontal semicircular canal was found to be gone. The sinus was filled with thrombus half way to torcular. The canal of the facial nerve was very necrotic and nerve was exposed for one-third of an inch. Following the operation there was relief from symptoms. There developed partial facial paralysis, which slowly cleared up. The patient was discharged, relieved, on January 2, 1914.

It is evident that all of these cases were advanced lateral sinus thrombosis, and had the medical attendants correctly diagnosed them, or had they had the help of any otologist, the true condition would have been found and a thorough operation would have saved more of them, and perhaps could have saved them all.

XLIV.

CAUTERIZATION OF MUCOUS MEMBRANES,
PARTICULARLY OF THE NASAL
MUCOSA—A PROTEST.

BY ERNEST DE WOLFE WALES, B. S., M. D.,

INDIANAPOLIS.

The normal nose is lined with mucosa, every part acting to moisten, warm and cleanse the inspiratory air. The amount of work the nose has to do is greatly increased by the dirty, smoky, ill-kept cities and the dry, overheated homes and offices, and still further increased by dusty occupations. The normal nose must have drainage room as a whole, and drainage of every gland in its mucosa. In fact, to have a normal nose an individual must have good general health. Not only may external irritants, as dust and gases, affect the nasal mucosa, but also internal irritants in the circulatory system, including uric acid, bacteria and their toxins. The lower turbinate adapts itself to the many changes of heat and cold, dryness and moisture, as well as changes of blood pressure and reflex changes by way of the nervous system. A normal nose is one of the joys of life. Even the appetite is enhanced by the sense of smell. No other sense brings sweeter memories and recollections than the organ of smell.

The object of this paper is to call attention to the fact that the function of the nose is the matter of greatest importance in the treatment of all nasal diseases, just as the function of the eye or ear is of first importance when life is not at stake. The reprehensible destruction of the nasal mucosa is so common that we as rhinologists cannot help entering a vigorous protest against this practice. If many writers were taken seriously, nearly all ills of the human body would be cured by destroying some part of the nasal mucosa. Most of these reports are one hundred per cent

sure cures. There are genital spots and bladder spots as well as hemorrhoidal, intestinal, hepatopancreatic, gastric and esophageal portions on the inferior turbinate, and by simply destroying certain areas of the normal mucosa, dysmenorrhea, enuresis and other troubles are cured. It would seem that all branches of medicine and surgery will be asking for the destruction of some part of the nose for troublesome symptoms. These treatments probably have a psychic action. If one uses a harmless treatment with powerful suggestion, it may be excused, but to destroy normal nasal mucosa for a symptom or trouble that may occur repeatedly is wrong.

To preserve or improve function is our ideal, and if the breathing space is sufficient, it matters little how crooked the nasal passages may be. If the nasal mucosa is swollen and shows a normal cocain reflex, then this turgescence is temporary, due to local or general irritation. If due to local irritation, mild, gentle treatment brings quick relief. If due to general disturbance, the nasal condition improves when the general congestion is removed, whether it is in the chest cavity or the abdominal cavity. Among the disorders causing congestion in the nose are alcoholism, cirrhosis of the liver, chronic digestive disorders, especially chronic intestinal trouble, and chronic constipation, chronic disease of the heart—as failure of compensation in mitral disease and aortic insufficiency. In leukemia and pseudo-leukemia, also congestion of the nose occurs at menstrual periods, at puberty, the climacteric, and during pregnancy. These cases are often sent to the specialist for operation, and make up the great number of cases where the cautery is used. It is the duty of the specialist to send these cases back to the general practitioner, and not destroy the nasal mucosa which is secondarily involved.

By cauterization is meant the application of the actual cautery and the stronger acids, such as chromic and trichloroacetic, the crystals of which are fused on a carrier and applied along the turbinates. Acids cannot always be controlled, whether used on the surface or applied by the submucous method. This does not include the solutions that do not destroy mucous membrane, such as a solution of ten grains of chromic acid to the ounce of water applied

to syphilitic ulcers and patches on the mucous membranes of the mouth cavity, advocated by the late Dr. Butlin of London.

Cauterization of any kind, almost without exception, should never be used in the nose. The exceptions are those cases of hemophilia or such conditions where it is necessary to save life. In fact, all solutions applied to the nasal mucosa should be so mild that they could be dropped into the eye. In other words, the nasal mucosa should be treated with the greatest gentleness. Much of the pathology of the nose is due to severe infections and neglected acute and chronic troubles, also deformities which should be treated by surgical means described in our best textbooks, but a great deal of the pathology of the nose is caused by destructive treatment of the nasal mucosa performed by the general practitioner, many specialists, and often by meddlesome treatment self administered. Most commonly the lower turbinate is cauterized, but scars on the middle turbinate and septum are not uncommon. The scars are often extensive. Sometimes the whole visible surface of the lower turbinate is whitened by scar tissue and the middle turbinate appears like an oyster.

The strongest argument against cauterization of any kind is that a slight pathologic condition is increased to a graver pathologic condition. The commonest result of cauterization is cystic degeneration. The small ducts of the serous and mucous glands are destroyed and sealed by scar tissue, causing atrophy, or the ducts are stenosed while the unimpaired glands keep on secreting and slowly form cysts. Some time after cauterization this cystic degeneration increases the size of the turbinate, and the breathing space is so impaired that a turbinate must be removed or resected. Again, these cysts may become infected and form pus sacs, which may burst or infect other regions, or by pressure cause atrophy or necrosis of the bone. Deep cauterization causes osteitis and marked atrophy.

The immediate result of these burns is a very sore, swollen mucosa, which in itself is painful. The inflammatory swelling may stop up the natural openings of the ethmoidal cells or the ducts to the sinuses, causing serous sinusitis (hydrops ex vacuo). If infection takes place, suppurative

sinusitis results. Sometimes the ears are secondarily infected at this time, as well as the tonsils and eyes.

One of the very common sequela of cauterization is synechiæ, and still worse is the great amount of scar tissue. Where the columnar ciliated epithelium is destroyed, squamous epithelium takes its place. On this scar tissue the secretions from neighboring mucous membrane flow. The secretions accumulate on the atrophied areas because there are no cilia to carry the secretions along, and after remaining here the inspiratory air causes evaporation, resulting in the formation of crusts. The atrophied areas have no secretions to float these crusts off, and so they stick, often overriding healthy mucosa. These crusts tend to cause irritation, which is manifested by sneezing and often by a watery discharge. The possible after-results of cauterization of the nose cause a disagreeable dryness, often accompanied by itching. If there is considerable scar tissue, crusts cause a discomfort with constant desire to pick the nose, accompanied by soreness and bleeding, due to the irritating crusts. Inspection shows a dry mucous membrane, often inflamed, covered with thin crusts, which may be tinged with blood, presenting an appearance similar to that of the septal mucous membrane after a sub-mucous operation. When the inferior turbinate has been streaked by the cautery, the turbinate often completely blocks the inferior meatus and finally becomes polypoid secondary to cystic degeneration, although this condition more often follows cauterization of the middle turbinate. These pathologic changes are so slow that their pathogenesis is forgotten. Where there is atrophy as a result of cauterization, the secretions become sticky and are difficult to remove. Oils often make the nose worse, and even mild alkalin or normal salt solutions seem to make the nose sore. This is due to the epithelial changes. A two per cent solution of boric acid sometimes gives relief, but must be used continuously, otherwise the patient is uncomfortable. The inflammation often extends to the conjunctivæ and keeps them inflamed. In some cases cauterization has caused interference through cicatrization with the drainage of the lacrimal and conjunctival sacs, which gives rise to a condition of conjunctival irritation which may be fol-

lowed by infection and its serious after-results. Even without infection, the mere presence of conjunctival irritation and epiphora subjects the patient to a most distressing train of symptoms.

Another danger of cauterization is purulent meningitis, which, however, is rare. The bead of acid has dropped off the carrier, causing deep burns in the nose, and has rarely entered the esophagus, later causing stricture. Another danger is new growth which may start from these irritated atrophied areas. In the Indianapolis clinic, Dr. J. R. Thrasher finds about one-third of all patients give a positive Wassermann reaction. Since it is claimed by some that most cases of cancer of the tongue and larynx are secondary to syphilis, the danger from scar tissue made in the nose, when syphilis is so common a disease, makes cauterization a serious matter. A nose scarred by numerous cauterizations necessarily loses its functional integrity and imposes a vast amount of extra work on the mucosa of the nasopharynx, larynx and bronchial tree, which do not and cannot perform the nasal functions. Such a scarred nose loses its feeling and the patient suffers from air hunger. Many hay fever patients are the victims of the train of chronic irritative results of cauterization. Often the mucous membrane in a patient suffering from hay fever will not present a normal cocain reflex. Cocain and adrenalin mixtures will not shrink the tissue to give relief, yet the same tissue will appear normal and give the normal cocain reflex when the hay fever season is over. Remove the irritation and nature does the rest.

It is so much easier to burn the nose than it is to find out the cause of the swollen nasal mucosa. Since many professors of rhinology are instructing students in the art of burning the mucosa, the practice has increased to an alarming extent. Much harm has been done by cauterizing the faucial tonsils and the nasopharynx. It is difficult to estimate the extent of this irrational treatment and its effects on the health of the individual. Cauterization of mucous membranes is an abominable and shameful practice. Anything which destroys the serous or mucous glands or decreases the normal sensitiveness of the nose, impairs its protective power. It is unsurgical to make unnecessary

scar tissue. Meddlesome irritative treatment and cauterization causes much of the chronic rhinitis and increases operative procedures. Why substitute squamous epithelium for ciliated columnar epithelium? It is the duty of the rhinologist to conserve as much mucosa as possible, because the mucosa is the functional part of the nose.

CONCLUSION.

Many pathologic conditions of the nose are caused by cauterization. As drinking caustic fluids generally causes death, so application of caustics to the nasal mucosa often destroys the function of the nose.

No therapy should be used in the nose that burns or irritates the uncocainized nasal mucosa, because such treatment causes chronic rhinitis.

Cauterization is a method of getting results without thought of final consequences. It is irrational and lessens the efficiency of the nose by destroying the integrity of the ciliated columnar epithelium, leaving in its place tissue which cannot carry on a single function of the nose.

XLV.

(1.)

A CASE OF SUPPURATIVE THYROIDITIS WITH
PERFORATION OF THE TRACHEA.

(2.)

AN UNUSUAL INFECTION OF THE EPIGLOTTIS
AND LARYNX IN A CHILD—TRACHEOTOMY
—RECOVERY.*

BY CLEMENT F. THEISEN, M. D.,

ALBANY.

The first case is that of an Italian, aged thirty-five years. He was first seen by the writer last November. The following incomplete history was obtained from his wife with the aid of an interpreter: About two weeks before, he developed a sore throat, and for several days had been spitting pus and blood. An examination of the throat at this time showed the following conditions: Both tonsils inflamed and enlarged. Slightly below and behind the right tonsil there was a discharge of pus, with an opening leading up behind the tonsil, from which pus could be squeezed out. It looked like an atypical quinsy that had ruptured spontaneously at an unusual place. The patient had lost a good deal of weight, as he had not been able to take much nourishment for nearly two weeks. A wash was prescribed for the throat, and the family was told to send for the writer if the patient did not improve. Nothing was heard from the patient for nearly two weeks, when the writer received a hurry call. On arriving at the house the patient was found sitting up in bed, breathing with difficulty. In the two weeks that had elapsed he had become greatly emaciated, and had been coughing up

*Read at the thirty-sixth annual meeting of the American Laryngological Association, May 25-27, 1914.

pus and blood almost constantly. With the aid of an interpreter we discovered that he had been in a hospital and had been treated with electricity! At this time there was a tremendous board-like infiltration and swelling of the entire front of the neck, particularly involving the thyroid gland, with a good deal of reddening of the skin. On deep palpation of the right lobe, which seemed to be most inflamed and swollen, we thought we got a feeling of slight fluctuation. Pressure at this point at once increased the cough and expectoration of pus. A diagnosis of probable suppurative thyroiditis was made, and the patient sent to St. Peter's Hospital, where the operation was performed the next morning. An incision into the right thyroid lobe entered an abscess cavity, and there was an immediate escape of air. It was found that there was an opening into the trachea almost large enough to admit the tip of the little finger. The patient got on fairly well for a week or ten days, although he constantly lost weight, when he insisted on going back home, where he died a few days later. There had been a constant profuse discharge of pus from the wound. This was examined for tubercle bacilli, but none were found. Cultures from the throat and also from the wound showed streptococci and staphylococci. No autopsy was permitted.

The primary seat of infection in this case was undoubtedly the abscess in the tissue back of the tonsil which had ruptured before the writer had been called in.

The rapid emaciation suggested a tuberculous process, but no bacilli were found in several examinations of the sputum, or in the pus. The lungs were also negative.

So far as the writer is concerned, this is a unique case.

The second case, an unusual infection of the epiglottis, is that of a boy twelve years old, who was seen by the writer early last May. I was asked to see him by the family physician, at his home in the country, a few miles from Albany. The boy had had measles a month before, and for a few days had complained of a very slight sore throat. When the throat was examined about four o'clock in the afternoon of May 6th, the only thing noticed in the pharynx was a slight redness of the mucosa. Tonsils were not inflamed. There was some trouble in breathing at this time, patient not being able to lie flat. When a laryngeal mirror was used the epi-

glottis was seen to be tremendously edematous and inflamed. Several incisions were made at once, and a culture taken directly from the epiglottis. An iced spray was ordered with ice in the mouth, and an ice coil around the neck. Temperature at this time was 103° F. At six o'clock the same day the boy's breathing was worse, and at seven we again went to the patient's home. He was sitting up in bed, breathing with extreme difficulty, and an immediate tracheotomy was performed. This relieved the breathing at once, and the boy made an uninterrupted recovery, but it was over a week before his temperature was normal, and there was a good deal of swelling of the glands of the neck.

The cultures taken from the epiglottis after scarification, and others taken through the tracheal canula, showed some staphylococci and streptococci. No diphtheria bacilli could be found. He was given an injection of antistreptococcic serum. The temperature, which remained high for a week, slowly subsided, and the swelling of the glands of the neck also slowly disappeared. When the swelling of the epiglottis subsided sufficiently, so that a view of the larynx could be obtained, some edema of the arytenoid mucosa was still present. This must have been considerable during the height of the attack, as suffocation was imminent just before the tracheotomy was performed. This condition was undoubtedly one of the curious infections of the epiglottis occasionally seen with a practically normal pharynx.

The writer has been of the opinion that such cases of acute infection, with edema of the lingual surface of the epiglottis, the edema being mainly limited to this surface, were distinct pathologic conditions belonging in a classification of their own. Several cases of this kind were reported in 1900.¹

An experience with several cases this winter, besides the one that is the subject of this paper, and including one of abscess of the lateral column of the pharynx, in which the edema extended first to the lymphoid tissue at the base of the tongue and then to the epiglottis, has somewhat changed the writer's views in this respect, and has led him to believe that Semon's views still hold good.

Swain,² in a very instructive paper on inflammation of the lateral columns of the pharynx, reports several interesting cases. In one in particular, where he was able to make a

thorough examination of the patient's throat after the rupture of an unsuspected abscess of the lingual tonsil, a subsiding swelling of the epiglottis and aryepiglottic fold could be seen.

Cases of inflammation of the lateral pharyngeal columns, either with or without abscess formation, frequently run the course of an atypical quinsy. Such was the case in the writer's case before referred to. The patient, a man aged fifty years, developed what was apparently a simple tonsillitis, both tonsils being involved. He got constantly worse, and within four or five days after the attack started, could open his mouth only with difficulty. Both tonsillar regions were greatly swollen and edematous, rather more marked on the left side. Several deep incisions in the peritonsillar tissue and in the supratonsillar fossa failed to show pus. A day or two after that the writer was impressed by the amount of swelling along the posterior and lateral wall of the pharynx, extending well up into the nasopharynx, and by the distance between the soft palate and posterior pharyngeal wall. A deep incision into the lateral swelling high up was followed by the escape of some pus, with almost immediate and steady improvement in the patient's condition. When a proper laryngeal examination could be made, considerable edema of the anterior surface of the epiglottis could be seen. This must have been much greater while the angina was severe, because there had been a good deal of difficulty in breathing. The name acute infectious epiglottitis was given to the cases reported in 1900, and the writer's opinion at that time, that these cases should be classified separately, was largely based on the normal pharyngeal findings. Probably if the cases had been seen from their very beginning, a primary origin somewhere in the pharynx might have been discovered.

Semon,³ in his valuable paper on the probable pathologic identity of the various forms of acute septic inflammations of the throat and neck, believes "that the various forms of acute septic inflammations of the throat and neck, hitherto considered as so many essentially different diseases, are in reality pathologically identical—that they merely represent degrees varying in virulence of one and the same process."

Case nine of the series of cases reported by Semon in this paper was similar in some respects to the one that is the sub-

ject of the writer's paper. It occurred in an adult and terminated fatally. In this case an acute edema of the epiglottis and arytenoepiglottic folds followed a transitory inflammation of the pharynx. When seen by Semon the pharynx was normal, but the epiglottis had been changed into "an enormous red colored edematous tumor." The patient also developed a brawny induration of the neck. This intensely acute septic condition had a fatal termination in less than seventy hours from its onset.

The origin of the infection in most such cases is undoubtedly somewhere in the ring of pharyngeal lymphoid tissue. This was so in several cases seen by the writer this winter (severe infections of the epiglottis with great edema, following apparently slight inflammatory processes in the pharynx), and has led him to believe that such conditions should perhaps not be classified as separate processes.

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XLVI.

THE IMPORTANCE OF DISTURBED METABOLISM
IN THE ETIOLOGY OF SECRETORY MIDDLE
EAR CONDITIONS.

By J. E. SHEPPARD, M. D.,

BROOKLYN.

At the 1905 meeting of the American Laryngological, Rhinological and Otological Society I read a paper entitled "Otitis Media Mucosa," in which I attributed the condition to a variety of causes, amongst others, "cold in the head, nasal polypi, hypertrophied third and fifth tonsils, blowing the nose too hard, nasal douche, washing the hair," etc., and to vasomotor rhinitis in only one case. In the rather general discussion which followed, the late Dr. Sprague attributed "many of these cases to some vasomotor disturbance or disease of the nervous system," adding, "there is usually some constitutional condition, such as disease of the stomach, liver or kidneys." Dr. Richardson said: "A good many of these cases are due to vasomotor disturbances, and constitutional treatment is indicated." From Dr. Stucky's remarks I quote: "The disease is not primarily a pathologic condition, but symptomatic. The general health, especially the gastrointestinal canal, should be thoroughly investigated and regulated." I wish to give credit to these three gentlemen, and especially to Dr. Stucky, for having thought further along the etiologic line in this condition than I at least, and perhaps than most of us, had done at that time.

In the present paper I wish to extend what I have to say to a somewhat larger field, to include many of the acute tubal conditions, with or without the outpouring of more or less serous fluid into the tympanic cavity; the more purely otitis media serosa, without marked involvement, at least when we see them, of the eustachian tubes; the cases of otitis media

mucosa; and most of those cases, perhaps all, in which the predominating symptom is a more or less profuse mucous or mucopurulent discharge from the ear. It is my present belief that all these cases of secretory middle ear conditions may be attributed to some vasomotor disturbance, usually a paralysis or paresis, involving in varying degrees the mucosa and underlying vascular areas of the nose, nasopharynx, eustachian tube, and tympanic cavity. In passing, I should like to emphasize the importance from the viewpoint of therapeutics of distinguishing clearly between this condition and a genuine hypertrophy of these structures. This vasomotor paralysis, or paresis, I believe to be in its turn an evidence, or expression, of some general toxemia acting upon the sympathetic nervous apparatus, and due, much more often than anything else, to a condition of disturbed metabolism and insufficient elimination.

Gould's definition of metabolism is: "The power that organized bodies possess of continuously using up and renewing the matter composing the body." By the term "disturbed metabolism" I wish to include in a rather broad general sense those abnormal conditions due to the amount we eat—to what we eat, and how we eat it, as well as to what we drink, and when we drink it; and by "insufficient elimination" I mean to include that by the bowel, the kidneys, and the skin.

Metabolism is easily disturbed by overeating, even of perfectly proper kinds of food. It is being more and more recognized, though not so generally acted upon, that mankind eats too much. By way of example, one of the most frequently observed errors is the addition to three abundant meals of a pint, a quart, or even more of milk—often sufficient milk of itself for a person to live on without the addition of one, to say nothing of three meals, a day.

A perfected metabolism depends undoubtedly to a great extent upon what we eat. Disturbance thereof arises much more often, in our experience, from excess of the protein foods, whether animal or vegetable, though oftener the former, than of the carbohydrates, although this latter group of foodstuffs would appear to be responsible for some of the disturbance, and more often in children than in adults. To cut down the supply of proteins it becomes necessary to limit

the supply of meats, particularly the red meats, meat-stock soups, eggs, milk, cream, and butter, among the usual articles of food, and for excess of the carbohydrates to limit the sugars and starches, by forbidding candy and excess of sugar in any form, by limiting potato, and the substitution of whole-wheat bread for the almost universally used white bread.

Under the heading of how we eat it, I wish particularly to emphasize the importance in this class of cases of proper, meaning thereby thorough, mastication of food. To accomplish this most practically, I insist upon my patients eating their meals dry, all fluids being forbidden from ten minutes before until a half hour after eating.

With regard to what we drink, and when we drink it, the latter part of the proposition has just been answered, and can be summed up in the following phrase: "As little as possible at meals, and as much as possible between meals." As to what our patients in this condition may be permitted to drink, it certainly is true that the nearer they come to limiting themselves to water the better, and it is of great importance to curtail to a minimum the use of alcoholics, and especially so their daily use, even in small quantities. Milk should not on any account form a regular part of the diet of those who eat their ordinary three meals, and no one will, I think, claim that tea and coffee, as ordinarily used, are conducive to a perfect metabolism.

Insufficient elimination, whether by bowel, kidney, or skin, is a most important factor in the upsetting of the metabolic process.

I feel that I perhaps owe you an apology for having occupied so much of your time with what is at best but a very imperfect and incomplete outline of what is required to accomplish the desired results in the class of cases under discussion. At the same time I have been forced by many unhappy experiences to a realization of the fact that, unless we ourselves take up this end of the treatment, and act upon a proper interpretation of the picture presented by the parts with which we have to deal, we will fail to obtain results.

I might, but will not, relate to you the history of many cases that have demonstrated conclusively the futility of purely local treatment, or for that matter of any local treatment, for the achievement of permanently satisfying results

in the so-called secretory middle ear catarrhs, thus completely reversing myself in what I had to say in the paper referred to above, in which I advocated repeated incision of the tympanic membrane as the only treatment that had at that time given results that were even partially satisfying.

I should like to recall to your minds the various pronouncements on this subject by our colleague, Dr. Stucky, in so far as it concerns our specialty, and as showing the far-reaching effects of disturbed metabolism on other organs and parts of the body, and as very suggestive to us, I would like to direct your attention to articles read by Dr. Plönies, of Hanover, Germany, and by Dr. L. F. Bishop, of New York, at the International Congress of Hygiene and Demography, held in September, 1912, at Washington, D. C., and published in Volume II, Part I, of their Transactions.

XLVII.

REPORT OF A CASE OF CHRONIC MENINGITIS
POSSIBLY OF OTITIC ORIGIN.

By J. J. THOMSON, M. D.,

NEW YORK CITY.

The patient, Louis S., age twelve years, was first seen by me on April 26, 1908. The previous February he had been operated upon for mastoiditis on the right side. The wound had never healed, in spite of several curettings; there was a fistula leading to the antrum, the middle ear was dry and the membrana tympani healed, and the boy appeared to be in good health.

On May 5th, nine days after his first visit, he had a severe chill and his temperature reached 104.2° F. Next morning it was 100.6° , pulse 100, and his respirations 24. That evening his temperature was 105.2° . He did not complain of any headache, there was no change in the appearance of the mastoid wound, and his fundus oculi were normal. I decided to wait a few days before operating on him in order to exclude erysipelas or other general conditions.

On May 9th an exploration of the lateral sinus was suggested to the family, the septic condition and temperature having continued. At this time the chest and abdomen were normal, he had no headache, but had a severe chill every other day. The highest daily temperature was 103.2° and the lowest 101° . The urine was normal except for an excess of indican, the fundi were still normal and there was no complaint from the patient. Blood culture was negative. Blood count gave 25,000 leucocytes, 85 per cent polymorphonuclears, 9.5 per cent lymphocytes, and 5.5 per cent mononuclears. The Widal test was negative, and there were no malarial plasmodia present.

May 11th consent to open the sinus was obtained. After

thorough exposure and opening no clot was found, and free bleeding occurred from both the cardiac and torcular ends. The jugular was not tied. Next day the temperature was 105°, pulse 118, and the patient had a chill lasting twenty-five minutes. He now began to complain of severe headache; the reflexes were normal and the eyes and pupils still normal.

May 13th he had a chill lasting thirty minutes, and the child was drowsy, sleeping a good deal, but in waking intervals complained of very severe pain all over his head. The cerebrospinal fluid at this time was normal, and blood count showed 15,500 leucocytes, polymorphonuclears 73.5 per cent, lymphocytes 24.5 per cent, hemoglobin 65 per cent. There was a great variation in the size of the red cells, and there were some poikilocytes. Until May 24th the condition remained about the same. On this day, on account of the temperature remaining septic and the child being drowsy, together with a weakened heart action and headache, the temporo-sphenoidal lobe and cerebellum were explored for pus, but none was found. From the time of this operation, however, the boy steadily improved and he was discharged from the hospital two weeks later. The wound healed promptly, and for nearly four years he enjoyed good health and mental vigor.

On March 4, 1912, I was called to see him again, and found him unconscious, and from the mother obtained the following history: At times for the past few months he has complained of slight headache, especially when stooping, and this was sometimes accompanied by dizziness. In the erect position he did not complain of either, and was never dizzy on the street. March 2d, he complained of the operated ear hurting him, and he had a headache. March 3d, at three o'clock in the afternoon, he had a slight chill, and he seemed unusually drowsy all day. At eleven o'clock he vomited a small amount of greenish fluid, and was nauseated several hours.

The morning of March 4th, he still complained of headache, began to have spasms involving all the extremities, but not the face, and at eleven o'clock he became unconscious and began to grind his teeth. His temperature, taken at this time, was 104°. I saw him in the evening. He was unconscious, pulse 78, temperature 104°, and was slightly rigid, but

had no convulsive movements. The pupils were equal and both contracted to light. There was a slight divergent strabismus, and a conjugate deviation of the eyes to the right. There was no nystagmus, but the eyes continually rolled from one side to the other, rarely passing the middle line on the left. The fundus could not be satisfactorily seen. There was no Kernig or Babinski sign, and the knee jerk could not be elicited. The mastoid wound was red and bulging slightly. The canal was so contracted that only a small portion of the membrana tympani could be seen, and this was quite red. Caloric test produced no result on the movement of the eyes.

That evening I opened the old mastoid wound and found the cavity of the mastoid filled with a brain hernia which was necrotic and very dark in color. There was no pus in the mastoid. The hernia was removed and the child returned to bed. Hé died the same night.

The autopsy findings were as follows: The dura is adherent over the middle line, and on removal tears away particles of brain tissue. The convolutions seem to be flattened on both sides of the brain. The pia is slightly opaque, and all the cerebral veins are much engorged. The brain seems unusually soft to the touch. A milky greenish yellow opacity follows all the veins of the cerebrum, and less markedly so those of the cerebellum. This looked like an exudate beneath the pia, but on stripping off the pia no exudate was seen and the opacity proved to be a thickening of that membrane itself. At the division of the larger vessels patches as large as a dime were present. The left lateral ventricle contained about .5 cc. of fluid, and the right lateral third and fourth ventricle contained no fluid whatever. This may account for the fact that we were unable to get any fluid from the spinal canal, either before or after death. The floor of the fourth ventricle showed very small petechial hemorrhages on its surface. The brain tissue itself in the cerebrum, cerebellum, pons and basal ganglia was normal. There was no indication of inflammation surrounding the area from which the hernia had been removed. The thickening of the pia was as marked over one hemisphere as over the other, and in many places was so adherent to the brain that it could not be stripped off without tearing it. There were small hemorrhages throughout the falx cerebri, and the veins of the falx cerebelli were tortuous

and thickened, also those of the tentorium. The wall of the superior longitudinal sinus was very much thickened.

The condition was apparently one of chronic meningitis, in which an acute exacerbation occurred, causing death. It is possible that the thickening of the pia may have been a result of his previous illness, at which no cause for the septic temperature was discovered and in which no diagnosis had been made. There was no fresh exudate found, and the process was so soon followed by death that it would appear to be caused by intracranial pressure due to edema or other cause, rather than by toxemia.

XLVIII.

THE USE OF VACCINES IN CHRONIC EAR INFECTIONS, WITH REPORT OF CASES TREATED.*

BY WILLIAM H. HASKIN, M. D.,

NEW YORK.

Now that the first enthusiasm for the radical mastoid operation—which led to vast numbers being subjected to it—has somewhat subsided and the profession has awakened to the actual results that have been produced by indiscriminate operative procedures on chronic suppurating ears, many are endeavoring to find some other method of treatment which will avoid the increased death rate that has followed its advent. Any careful and thoughtful reader of medical literature is bound to realize that the operation must be classed as an exceedingly dangerous one because of the subsequent conditions that so frequently arise, which must be attributed to the operation.

This paper is not on the subject of the radical operation, however, but is to tell of the work that is being done in Dr. McKernon's clinic with vaccines in the treatment of chronic suppurations. In no disease is the golden rule more applicable, and it is pretty certain that there are few medical men who would submit either themselves or any member of their families to this dangerous operation until after every other method had failed. We rarely find it necessary to operate upon our private patients, for the simple reason that careful treatment, given personally, seldom fails to relieve the patient. As a matter of fact, the writer has not performed a radical operation upon a private patient during the past eight years.

With the vast armies that flock to our clinics we naturally

*Read before the Section on Otology, New York Academy of Medicine, March 13, 1914.

have a far more difficult problem, having in so many instances to deal with filth, poverty, ignorance, and superstition, a combination that makes it almost hopeless to get results by any method; even operations failing. When these clinic patients are fairly intelligent and have risen above filth and actual poverty, they can be taught to understand their condition and the correct methods of taking care of their ears with most gratifying results. There are always some cases, however, that appear to resist every effort, and during the past winter we have been trying autogenous vaccines upon these, following the general plans as laid down by Dr. Nagle in her two papers in which she reported the results of vaccines in seventy cases. She did not give the bacteriology nor describe the actual conditions found in these, so that her work has been questioned by many. This is an injustice to her, when it is realized that the large percentage of the cases were referred to her by such men as Blake, Cobb, Emerson, Mosher, Walker, and others in Boston, and that the actual laboratory work was done in the Harvard Medical School, so that all of her work was actually under supervision.

She says: "In all, seventy cases have been reported by me during the past four years. Of these, sixty have remained dry; five failed to continue treatment; two have recurred; and three are still under treatment. It must be remembered that many of these cases were so persistent that the radical operation had been urged.

"While I recognize that the personal element enters into a report of any new line of treatment, yet I have endeavored to counteract this by having the results supervised."

Her last statement is undoubtedly true, and applies not only to her work, but to the different results that will be obtained by any two men working on the same lines in a given series of cases.

In 1908 the writer reported the results of treatment of chronic suppurations with active cultures of the lactic acid bacillus in a series of cases. The striking results then reported have continued to be obtained in a great many others, and the cultures are generally the first thing ordered by him in all chronic cases, careful instructions being given each time. Many associates have told him that they do not get results, so that here again the personal element must play a part, as there

is no doubt of the results in the writer's hands, many of the patients having been observed by members of the clinic.

After reading Dr. Nagle's papers we realized why we had failed to secure satisfactory cultures in our first attempt, made about four years ago. We now first cleanse the canal with the vacuum cleaner, sucking out all visible secretions from the attic and eustachian tube. Then a pledget of cotton saturated with alcohol is packed in the canal and kept there for five minutes. If the perforation is large enough the sterile platinum loop is introduced into the attic, and any secretion is transferred immediately upon blood acetic agar plates. If perforation is small the Siegel otoscope is used to draw into sight any secretion there may be, and transfer is then made. A slide is then smeared with secretion obtained on a cotton covered applicator.

With this technic, we have never failed to secure growth of one or more pathogenic bacteria, from which active autogenous vaccines have been prepared.

Of the patients treated, several had been coming to our clinic for years; others had been treated elsewhere until operation was proposed, while others denied ever having had any treatment. All cases were diagnosed and assigned for treatment by the examining surgeon.

It is unnecessary to describe to this assembly the actual condition of each individual ear. Suffice it to say that almost every possible pathologic change was found in one or other of these cases, including polypi, cholesteatoma, adhesive bands, fistulae, caries, and constrictions. The patients included the young and old of both sexes, and were drawn from all quarters. Dr. Rae had performed a most successful operation on one ear of a patient, and left the other to be treated with vaccines. Several patients had already been operated upon, but discharge persisted.

Although we have had about one hundred and eighteen cases assigned to us, comparatively few (thirty-three) have been given vaccine, owing to the fact that in the others all discharges were arrested by local treatment before the autogenous vaccines could be prepared or they had failed to return. Owing to the small number of cases and the short period of observation, this paper is offered only as a preliminary report, from which no positive conclusions are to be

drawn. Before this can be done, it will be necessary to treat several hundred cases and follow them over a period of years, to observe the ultimate effects.

Since beginning this investigation we have had one hundred and eighteen cases assigned or transferred to us. Cultures have been taken in only fifty-two, and vaccines have been administered in only thirty-three of these. This is explained in three ways. In a large number of cases the discharge stopped under careful local treatment; some failed to return; and a few objected to the hypodermic administration. We have included in the list seven cases of mastoiditis which were cured by vaccines about a year ago. Three other mastoid cases have been cured this winter that are not included. Dr. Brown has also reported eight other cases, treated by vaccines for furunculosis, in which chronic middle ear suppurations, existing at the same time, were cured by the vaccine. One case of ours, still under treatment, had been operated upon twice in another clinic without relief, and was then referred to us and is now practically well. Two cases were operated upon by Dr. C—, but discharge persisted until vaccines were administered, when they promptly dried up.

Of the ten cases of mastoiditis, four were streptococcus infections; five, staphylococcus; and one, bacillus proteus vulgaris. All ten made prompt and complete recoveries.

We have not followed the dosage as used by Dr. Nagle, but have given much larger doses from the beginning, repeating every fourth or fifth day, and stopping as soon as the ears have become dry. The patients are then requested to report every two weeks for observation, so that any recurrence could be promptly noted. As Dr. Nagle states, under vaccine treatment the patient's general health almost invariably improves, this being especially noticeable in children.

In her first paper Dr. Nagle reported that in a number of cases a stock laboratory staphylococcus vaccine had been given while waiting for the autogenous vaccine, and that marked improvement was frequently noted even when other bacterial infection was present, the resistance for the other bacteria being apparently raised by the stock vaccine. This interesting observation is clearly borne out in the eight cases reported by Dr. Brown, in which there were both furunculosis and middle ear suppuration present. His case No. 10, where a mastoid

operation had been performed and vaccines had been used elsewhere, is particularly interesting, illustrating again the importance of the personal element.

Four of our own cases were also double infections of furunculosis and chronic suppurations, and stock staphylococcus vaccines were given, with resulting cure of both conditions.

As shown by the table, thirty-three cases received treatment with vaccines. Of these, two are noted as "final results unknown," as the patients failed to return after their ears became dry; eight were improved and are still under observation; twenty-three have dry ears and are seen about every two weeks. All have appreciated the personal interest shown to them, and it is fairly certain that they will return on the first indication of any discharge appearing.

As said before, excepting the mastoiditis infections, all our cases have been seen during the past five months only, and we are not justified in claiming absolute cures for them. We hope to follow them for several years, as has been done by Dr. Nagle, and to report them again, possibly each year. In our own mind we are convinced that most excellent results have been obtained with the vaccines, especially so as many of our cases had resisted all other efforts, even failing to dry up after operation.

As so many cases have dried up under our local treatment, it may be interesting to state the method employed. It is well to remember that in treating any suppurative process in the ear it is necessary to keep all moisture out of the canal. If the patients are told to irrigate, it is safe to say that the canals are never actually dried after the irrigation, and treatment will be prolonged indefinitely. Bichlorid irrigations invariably keep up discharge, if persisted in, due to the irritation of its constant presence in the canal. We have found that active cultures of the bacillus *Bulgaricus* will promptly overcome offensive discharges in most cases, and when the membranes are thickened the cultures frequently restore them to a healthy color after a very few applications. We employ suction with small cannulas to remove all secretions from the canals, tympani, and attics, and as soon as the offensiveness disappears, sufficient drying powder—aristol or nosophen with compound stearate of zinc or boric acid—is blown in to fill the inner portion of the canal. At subsequent visits the

canal is cleaned with suction, or alcohol on cotton applicators, if there has been no secretion, and is again dusted, and the patients are told to do nothing except to wipe out any secretion that may come.

In private practice the writer has yet to see a case that has not dried up and remained so under this method of treatment, when combined with proper nasal care.

XLIX.

TWO OBSCURE CASES OF RESOLVING MASTOID-
ITIS—THE OPERATIVE INDICATIONS.*

By HUGH B. BLACKWELL, M. D.,

NEW YORK.

On November 18, 1913, Mrs. C. was admitted to the New York Eye and Ear Infirmary for mastoid operation. She gave the following history:

Some five weeks before, she was suddenly taken ill with a severe ache in the left ear. A more or less unsatisfactory myringotomy was performed. Some three days later I was called to see her for the first time. Aural examination revealed an acute middle ear abscess with unruptured drum and dry canal, associated with moderate tenderness over the tip, antrum, and emissary regions. A myringotomy was performed under gas anesthesia, and was followed by a free escape of pus and blood. I did not see the patient for the following ten days, at the end of which time she reported at my office. Aural examination revealed a dry canal, healed drum, absence of mastoid tenderness, hearing about normal. The patient, however, complained of some malaise, and had a temperature of 100.4°. She stated that she had had a tuberculous infection of the lungs and had suffered from a chronic form of intestinal catarrh. Examination of her chest revealed an old lesion in the right apex. The patient continued to report for the following eighteen days at the office, coming at intervals of three or four days. Being a very active woman socially, she was out nearly every day, and, also, generally in the evening. She stated that about every fourth or fifth night she had difficulty in sleeping, due, as she expressed it, to a sense of fullness and heaviness in her head, but without any actual pain in either her head or ear. Her head would feel queer at those times, and on the following day she would not

*Read before the Section on Otology, New York Academy of Medicine, March 13, 1914.

feel so well, and in consequence came to see me at the office. At these times the aural examination was absolutely negative—normal drum, normal hearing, no mastoid tenderness, but generally a temperature of 100° or 99.6° , never over 100.4° . The patient, who was a very intelligent woman, stated that she believed this amount of temperature was a normal condition with her, owing to the intestinal catarrh and, possibly, to the chest condition. She was convinced, however, that her head was not right. Accordingly she was sent to Dr. Dixon for an X-ray examination. This was sixteen days after the drum became normal and thirty days after the onset of the ear trouble.

The right or normal side showed a pneumatic mastoid, with cells running fairly high in the squama and forward to the postglenoid process of the zygoma. The sinus was a little forward.

The left—diseased—side showed the same type of big zygomatic cells running forward to the tubercle. The sinus was a little forward and covered with cells. The whole mastoid was a little hazy as compared with the right side. Dr. Dixon stated that he did not consider that the plate warranted opening the mastoid, as the haziness was very slight.

Thirty-one days after the onset of the trouble, and eighteen days after the ear had apparently returned to the normal, and three days after the X-ray examination was made, the patient suddenly developed symptoms of basilar meningitis and died within twenty-four hours. A few hours after the symptoms of meningitis she was sent to the hospital, and a simple mastoid operation was performed, the entire under surface of the temporosphenoidal lobe being exposed, as well as a portion of its external surface, about one inch in width. The dura of the posterior fossa, internal to the knee of the sinus, and also the sinus itself, and cerebellum, posterior to the sinus, was exposed throughout. No pus was found in the mastoid; only some softened bone in the region of the antrum, and scattered granulation tissue. A great many of the cells contained air. The mastoid looked as though it had almost resolved. The dura did not present any abnormal appearance, and the brain did not seem to be under any tension. It was not incised at that time.

Eight hours after the operation the dura of the middle and

posterior fossæ was incised and the brain of middle and posterior fossa explored with the knife. No result.

Just prior to the operation the blood examination showed 33,500 leucocytes and 91.6 per cent polymorphonuclear leucocytes.

The spinal fluid drained from the cord, at the time of operation, was very cloudy and showed 3500 cells to the cubic millimeter. Smears from this fluid showed a large number of mixed germs present—pneumococcus, streptococcus, and staphylococcus.

Death ensued sixteen hours after the operation, with a typical end picture of meningitis—e. g., opisthotonos, dilated irregular pupils, strabismus, coma, temperature 106°, rapid pulse, etc.

Case 2.—On January 20, 1914, R. B., forty-six years of age, was admitted to the service of Dr. Robert Lewis, at the New York Eye and Ear Infirmary, for mastoid operation, with the following history:

Eighteen days before admission he was seized with pain in the left ear. After three days of more or less pain the left drum was incised; the ear discharged for a day or two and then the discharge ceased. For the past two weeks the ear had been dry, and the patient suffered no pain in his ear and had no definite pain in his head. During this time, however, he was unable to sleep, claiming that his head felt queer, and in consequence he was nervous. He was quite sure that he had no headache or earache.

Aural examination showed a dry external auditory canal. The drum was intact and almost normal in appearance, with no bulging. The hearing was good, and there was no mastoid tenderness.

On January 19th, the day before the operation was performed, the blood was examined and found to contain 17,000 leucocytes and 60.8 per cent polynuclear cells. An X-ray examination was made at the same time by Dr. Dixon, and his report reads as follows: "The right, or normal side, seems to be an infantile mastoid, with sinus well formed. The left, or diseased, side is rather large celled, pneumatic in type, and cloudy throughout. The sinus is covered with rather indistinct cells and seems to be forward. It appears to be an operative case from an X-ray point of view."

Operation was performed, and the mastoid was found to be filled with pus and granulations. The patient ultimately made a good recovery, and is now cured.

CONCLUSIONS.

These two cases represent the extreme ranges of pathologic change which may take place within the mastoid without giving any definite symptoms of ear disease. The first case shows that only a very slight pathologic change in the mastoid may produce a most severe intracranial complication—e. g., meningitis; and also that it is impossible for the X-ray to determine the severe nature of these slight pathologic changes.

The second case illustrates the value of the X-ray in recognizing the more marked pathologic conditions within the mastoid, when those conditions give rise to no definite clinical symptoms.

As regards the operative indications in these cases, it does not seem that any definite indications can be laid down. Certain points are shown in these two cases. First, the history of previous ear disease. Second, the strange restlessness shown by these two patients. They seemed to be in a state of mental stimulation—due possibly to the congestion or stimulation of the brain, and their conviction that their heads were at fault, and their persistence in sticking to this idea, although neither of them had any subjective or objective symptoms—no pain in either the ear or the head—but simply the conviction that the head was at fault. Third, the slight temperature, as shown in the first case, the malaise, the indefinite character. Fourth, the importance of eliminating all other causes as etiologic factors in producing the above symptoms. Fifth, the importance of the X-ray in making a diagnosis in these cases. The first case did not have sufficient pathologic changes in the mastoid to reveal the condition in the X-ray plate, but in the second case the pathologic condition was quite marked, and the diagnosis was made on the X-ray report. When the latter patient was seen in the clinic, it was not thought that an operation would be necessary; but as the X-ray plate showed a diseased mastoid, despite the fact that there were no symptoms of mastoiditis, an operation was performed, and the mastoid was found to be filled with pus and diseased bone.

L.

REPORT AND COMMENTS ON TWENTY-SIX CASES
OF TONSILLECTOMY, TWO AND A HALF
YEARS AFTER OPERATION.*

BY ALFRED LEWY, M. D.,

CHICAGO.

Last winter we undertook to examine a number of patients on whom tonsillectomy had been performed two and a half or more years before, with a view to ascertaining the permanent results obtained and adding to the sum total of our knowledge concerning the results of this operation. A similar and larger list was published by Clark, of Boston (*ANNALS OF OTOLGY*, June, 1913), and altogether his results appear more favorable than ours; but his list being larger, he does not publish his cases in the same detail as is herein observed. These patients were all observed at the Illinois Charitable Eye and Ear Infirmary, on the service of Dr. Norval Pierce, and all but one or two of them were operated there.

Four hundred cards were sent out, as a result of which twenty-four patients reported for examination. Two others, not on the card list, came in for other reasons, and are included in the list below.

The conditions investigated were:

Local.—Remains of adenoid or tonsil tissue. Deformities. Present condition of upper respiratory tract.

General.—Growth and nutrition as compared with other (nonoperated) members of the same family. General health. Tendency to local and systemic infections. Cervical adenitis; goitre; condition of ears.

The results are reported in detail in the following list:

*Read before the Chicago Laryngological and Otological Society, March 17, 1914.

REPORT ON TWENTY-SIX CASES OF TONSILLECTOMY TWO AND A HALF YEARS AFTER OPERATION.

TONSILLECTOMY SEVERAL YEARS AFTER OPERATION.

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No.	Name.	Age.	Cause for removal.	Result.
1	J. B.	9	Frequent sore throat; discharge from ears.	Left ear well; chronic suppurative in right ear.
2	S. F.	8	Postnasal discharge.	Discharge same, otherwise well. Tonsils and adenoids completely removed.
3	J. V.	15	Size.	Frequent and stubborn laryngitis since operation. Pus in olfactory fissure and in nasopharynx. Small tonsil vestige.
4	J. E.	12	Colds and sore throat.	Well since operation. Small tonsil vestige.
5	A. V. D.	8	Nasal obstruction; discharge from ear.	Looks well; ears dry, but occasional pain. Eczema narium and discharge from nose.
6	E. E.	8	Size.	Below average size for age; left membrana tympani retracted.
7	A. Z.	12	Unknown.	Tonsil vestige; nosebleed; hypertrophic pharyngitis; mentally subnormal.
8	L. B.	24	Frequent sore throat; chronic suppurative in ears.	Ears dry, but membrane perforated; occasional sore throat.
9	J. R.	25	Chronic suppurative in ears.	Ears dry; tonsil vestige; also had septal spur removed.
10	M. F.	14	Unknown.	Tonsil vestige; fauces now inflamed; septal ridge unre-moved.
11	M. S.	10	Chronic suppurative in ears.	Thin and pale, but ears somewhat better. Voice of nasal obstruction, but no adenoids present.
12	R. A.	10	Size.	Is well and was before operation.
13	J. L.	12	Size; earache.	Chronic suppurative in left ear; O. M. C. in right; purulent nasal discharge; cervical adenitis; strabismus; below average size, but well nourished.

REPORT ON TWENTY-SIX CASES OF TONSILLECTOMY TWO AND A HALF YEARS AFTER OPERATION.

No.	Name.	Age.	Cause for removal.	Result.
14	A. F.	15	Size.	Septal deviation; prognathism; right membrana tympani retracted; nutrition good; diphtheria and mumps since operation.
15	J. P.	5	Size.	Small, pale and thin; left membrana tympani calcareous; right opaque and retracted; acute rhinitis now; frequent colds.
16	M. F.	42	Suppuration in ear.	Mastoid operation about same time with cure. Health better since.
17	A. H.	11	Size.	Mouth breather; high arch, small nose; retracted right membrana tympani; slow in school.
18	G. V.	11	Deafness.	Hearing good now; small and thin.
19	H. N.	15	Size; adenitis.	Cervical adenitis less than six months ago; under size; no menstruation yet, though sister began at 14; mother dead; tuberculosis.
20	S. T.	13	Nasal obstruction and sore throat.	Relief four months; now again nasal obstruction and sore throat, but less frequently. Frequent laryngitis. Small tonsil vestige. Occasional nausea.
21	A. M.	18	Unknown.	Thinks he is stronger since operation; laryngitis; follicular enlargement on pillars of fauces.
22	H. D.	20	Nasal obstruction.	Chronic follicular pharyngitis; "lump" in throat; slightly deformed arch.
23	A. W.	13	Frequent sore throat; nasal obstruction.	Breathes freely; less frequent sore throat; enlarged cervical glands and small goiter.
24	I. M.	14	Size.	Slight adenoid vestige and lateral pharyngitis right; large and fat.
25	R.	8	Cervical adenitis.	Subsidence of adenitis after operation eleven months ago, but recurrence now; submental and posterior cervical groups involved; tuberculosis. (?)
26	H. K.	7	Size and frequent sore throat.	Operation three years ago. Under size; both membrana tympani retracted, but less sore throat.

COMMENTS.

Nine patients, Nos. 1, 4, 5, 8, 9, 12, 16, 18 and 23, were improved or cured of the condition for which the operation was performed. Four of these were operated because of suppurating ears (Nos. 1, 8, 9 and 16), and one, No. 18, for non-suppurative deafness. The improvement in these cases may have been due to the removal of adenoids, which was done at the same time. No. 16 also had a mastoid operation.

Seventeen patients were apparently not benefited. Three, Nos. 3, 20 and 21, are now troubled with laryngitis, which tendency appeared subsequent to the tonsil removal. It is rather difficult to account for this except in the case of No. 3, which shows evidence of sinusitis.

Of five patients under the age of six at the time of operation, three, Nos. 6, 15 and 26, are undersized. Of the other two who seem to be of good general health and development, No. 2 still has the postnasal discharge which was one of the indications for operation, and No. 5 still has a nasal discharge, although cured of a discharging ear. In neither could sinusitis be demonstrated, nor does either show any tonsil or adenoid vestige.

There was little to criticise so far as the mechanical part of the surgery was concerned. One patient showed a little asymmetry of the arch. Several showed slight tonsil remains but not of a degree or kind that appeared to be causing any trouble.

The conditions that appear to have been benefited are "frequent sore throat" and "ear troubles." Of course the cases of simple hypertrophy were relieved of the enlargement, but two of these and one other, in children under six, now show evidence of retarded growth; whether due to the removal of tonsils or not we cannot say. Only one child gave a history of infectious disease since the operation, but many of the patients are of an age when the diseases of childhood are no longer common. In none of the cases do we get any light on the subject of the relation of the tonsils to arthritis or other systemic infections.

Twenty-six cases are too few from which to draw any definite general conclusions; however, we must admit that so far as this list is concerned the results obtained did not justify

the operation in seventeen out of the twenty-six. I believe our indications for operation are as conservative as those of any clinic in Chicago, but we now restrict still further our indications for tonsillectomy. In children before the age of the second dentition I believe we should perform a tonsillotomy for simple hypertrophy, or wherever possible confine ourselves to removal of the adenoid hypertrophy. This of course does not apply to cases where the tonsils are removed because they are manifestly diseased or for systemic conditions. There are few operations attended by more gratifying results than is tonsillectomy in properly selected cases. The above list suggests that we still have something to learn about the proper selection of cases. I do not think the removal of tonsils is indicated in the absence of direct evidence of their causal relation to the condition for which relief is sought, that is, on suspicion, except perhaps in the case of certain systemic infections (arthritis, etc.), in which diligent search by competent men has failed to reveal any other source of infection or portal of entry, and in which other systematic treatment has failed.

LI.

DOUBLE RADICAL MASTOIDECTOMY IN DEMENTIA PRECOX WITH PHENOMENAL IMPROVEMENT IN MENTAL AND PHYSICAL CONDITION.*

BY GEORGE E. DAVIS, M. D.,

NEW YORK.

Some time since, Stucky called attention to some serious forms of mental disturbances arising from chronic suppuration in the nasal accessory sinuses, and reported a number of cases. When we consider the complex nervous mechanism controlling the mind and body, and that their every function is a manifestation of direct or reflex stimuli, we can readily understand how a pathologic process in any part of the organism may react upon and disturb such intricate and delicate mechanism. Therefore, if this is so in the rational subject, we are on safer, or, at least, less polemic grounds, in assuming that the toxic action of suppurative processes, particularly if situated in immediate proximity to the great nerve centers, will produce a relatively greater mental disturbance in cases afflicted with psychoses, ranging from the simple neurotic to the profoundly insane.

The precox case I am reporting comes under the latter classification. The beneficial results, mental and physical, following a double radical mastoidectomy, on account of chronic middle ear suppuration, seem to bear direct evidence as to the effect sepsis had in aggravating his psychosis and lowering his physical condition.

The following is a brief abstract of the history of the case: Thomas R. M., age, twenty-three years; nativity, Germany; occupation, painter; married. Was admitted to Central Islip State Hospital, September 12, 1907. On admission he had a

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dull, apathetic look, appeared somewhat bewildered and a little restless. He answered questions relevantly, but in a dull way, and frequently appeared to have difficulty in thinking and remembering. His memory was impaired for recent events. Reasoning and judgment were very defective. Physically he was poorly developed, assumed unusual poses and positions, and gave little response to tests. Knee jerks sluggish.

After admission he appeared dull and depressed; stared about in a confused way. He became generally more untidy in his habits, and was at times destructive to his clothing.

On March 25, 1909, I did a radical mastoid operation on the right side; a large cholesteatomatous mass was found.

May 4, 1909, I performed the same operation on the left ear, the right having closed in and showing only a slight discharge. Patient progressed without incident after the second operation. He appeared confused and was unable to give any information concerning his feelings.

During June and July he showed a gradual but very marked improvement in his mental condition. He became neat and tidy in his habits, bright and active in his appearance, was able to answer questions in a relevant way, and his memory appeared very good.

Physically, there was a marked improvement in his health, and a gain of several pounds in weight. During the remainder of his residence in the hospital he continued to show a mental and physical improvement. He talked and wrote in a rational way; showed no evidence of delusions or hallucinations. He was well behaved, had a good grasp of his position and surroundings, but was inclined to be somewhat listless. At the time of his discharge he had gained many pounds in weight.

He was discharged June 16, 1910, to his own care, to accompany his sister to Germany.

A second case I have to report from my records is even more convincing than the first, as to the deleterious effect of septic processes on the mental conditions, particularly in the insane. The patient, J. T., age, twenty-one years, Irish, was admitted to the Psychopathic Ward, Bellevue Hospital, November 26, 1910. He was noted as being restless, excited and disturbed, and had to be forcibly restrained. He was transferred

to Central Islip State Hospital, November 29, 1910. There the record shows that he continued to be markedly excited, without any tendency to improvement. On December 12, 1910, his right ear was noticed discharging and he began to show mental clearing; he appeared to steadily improve until December 30th, when his temperature suddenly rose, and examination showed the opening in his ear drum had closed. There was a second spontaneous rupture with a free discharge of pus and a relief from the symptoms, but this did not continue, so, on January 5, 1911, I performed a right mastoidectomy. The hospital chart on January 11, 1911, further records that "there has been a fairly steady progressive improvement in the patient's condition since the operation. Temperature this morning is normal for the first time. He is free from discomfort and is mentally clear. He is rather subdued in manner, does not talk freely, but reads newspapers and letters," etc.

"February 3, 1911. He has been quiet and tractable and has conducted himself in a normal manner, conversing with others, reading papers and magazines, corresponding with his relatives. He was today given a complete mental examination and was found to be normal."

"March 2, 1911. The improvement in his condition has been maintained and he was today discharged in care of his sister."

The hospital report of this case, made by Dr. West, one of the staff, shows that here we have a psychosis occurring in a young man, twenty-one years of age, normal makeup and good heredity, characterized by delirium, disorientation, and overactivity, flight and distractability, clearing up, with an amnesia for a period covering about three weeks, due probably to tonsillitis followed by otitis media and mastoiditis, accompanied by emaciation, exhaustion with uneventful recovery following mastoidectomy.

He concludes by stating that this was a maniac depressive psychosis, and that the mental symptoms were the expression of the underlying physical disorder. He interpreted "the symptoms, as the delirium, disorientation, restlessness, and amnesia of an infective exhaustive psychosis, an infection delirium."

LII.

FURUNCULOSIS OF THE EAR WITH TREATMENT BY VACCINES.*

By H. BEATTIE BROWN, M. D.,

NEW YORK.

Since the introduction of vaccine therapy, as suggested on a scientific basis by Jenner, the number of research workers has been large, and while most of the recent work in this field has followed the lines laid down by Wright of London, perhaps the two investigators to whom we owe most are Hiss and Dwyer of our own city—and I am glad that Dr. Dwyer is present with us tonight to enter into the discussion of this subject.

Although opposition to vaccine therapy was at first almost universal, even as late as 1910, when Dwyer furnished to the profession his very valuable article on the production and use of the vaccines, many of our profession were still loud in their denunciation of this form of treatment. Nearly five years have passed, and today one is safe in saying that owing to the painstaking and laborious work of investigators in this field we have a preparation the value of which can scarcely be overestimated, and when used in the correct way, by the proper man, at the right time, we have in the Hiss extract of leucocytes, and in the vaccine, agents for combating certain diseased conditions that have no equal, and whose use has abundantly proved all that is claimed for them; and now the almost universal cry of the profession is for the use of the vaccines. Inasmuch as it is from gatherings like this that ideas go forth not only to the profession but to a world of manufacturers as well, it appears to the writer that this is an opportune time to advise as strongly as possible against the use of stock vac-

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cines, put up and sold by all sorts of manufacturing concerns. There are even now many physicians attempting to secure results from the vaccines, some of whom express themselves as having no faith in these remedies, and I am inclined to believe that such skepticism is the result either of a lack of acquaintance with the preparation used or because, having used a wrong preparation prepared in the wrong way, used at the wrong time, upon the wrong patient, a good effect has not been produced.

At the very beginning it is necessary to recognize the fact that the Hiss extract of leucocytes, the serums, and the vaccines, are three independent and wholly different preparations; performing their work in the system by different physiologic methods, and not all intended for use in the same patient at one time.

We consider now the vaccine therapy in its relation to aural lesions, and, particularly, furunculosis, the foundation of which is the fact that when a foreign body, especially one of an albuminous nature, is injected into the human system, it stimulates the system to the formation of antibodies which combat the offending organisms, and that each particular strain has power only to form antibodies of a corresponding nature in the system. It is easy to see that if the physician injects into a patient a strain of staphylococcus vaccine, while the infecting agent in the patient's system is the streptococcus, inasmuch as the organism injected can only form antibodies that will combat organisms of its own species, in the case just specified there would be no antibodies formed to act against the streptococci, and the natural result, which ought to be expected, would be failure. Therefore, two facts are self-evident: First, the right vaccine must be used. Second, a correct diagnosis ought to be made before beginning treatment.

There seems to be no limit to the number of articles written upon the first question—What vaccine shall be used? Answer, without any hesitation: An autogenous vaccine.

Autogenous vaccines are procured from cultures made from the patient who is to receive the treatment. In autogenous vaccines the species of bacteria are isolated and grown in pure culture, from which the vaccine is produced, and when used in a single strain, or in combination, the proper dosage is regulated at the time of administering it.

The "market"—socalled "stock"—vaccine is in many cases the product from some old original strain, kept no one knows how long on artificial media in the manufacturer's laboratory.

The name "polyvalent" has been applied to a shotgun charge of mixed stock vaccines, the purpose of which is to hit a minute and possibly uncertain species of bacterium with a charge of therapeutic ammunition that will spread over a large area.

There is too often no correspondence between the contents of such vaccines and the organisms which they are intended to combat, and, moreover, their use is unscientific and decidedly unfair to the patient. As a remedy for lack of skill, stock vaccines—often fantastic in their composition, and of no value—are proposed by the manufacturer. We do not know what will be proposed next. It may be unknown mixtures of dangerous composition, let loose upon the profession like a flood, and heralded as the genuine thing that will overcome every form of microbic or bacterial infection. Surely it is a duty incumbent upon every member of our profession, and particularly upon the members of this society, to deprecate the use of these miscellaneous productions, and especially so in view of the fact that now there are so many reliable men and laboratories of our own profession who furnish the correct thing.

The second question relates to diagnosis. It is evident from what has been said about the formation of antibodies, that the first absolutely essential thing in the successful treatment of infectious conditions of the ear by vaccine is the establishment of a correct diagnosis. On more than one occasion have I heard from critics who have said that they have no use for vaccines, because they have tried them in every way, only to meet with disappointing results. Now, what has been the cause of these failures? Of course, anyone can put some pus on slant agar, heat it to 60° C., dilute it with saline, and then inject the resultant mixture into an unsuspecting patient, and probably have failure, so far as a good result on the lesion is concerned: but in the use of vaccine therapy it is just as important to establish a correct and definite diagnosis, if a good result is to be secured, as it is to be sure of one's diagnosis before beginning treatment of a heart or kidney lesion. Every man and every laboratory does not do this. For the successful treatment of these infected conditions of the audi-

tory apparatus, one must first know what organism is doing the damage, not only as regards the morphology, by aid of the microscope, but by a thorough study of a culture, and even, if found necessary, by animal experimentation as well. In other words, a correct diagnosis must be made. It is not necessary in every case to employ every step of the process just specified, for in some cases the condition is self-evident.

The technic used by us is as follows: The auditory canal is first irrigated thoroughly with boric acid or saline solution, or wiped clean with cotton, and then the canal is plugged with cotton impregnated with 95 per cent alcohol, which is allowed to remain in situ for about fifteen minutes. The cotton plug is then removed, and with the aid of Siegel's otoscope the pus is removed through the perforation. In this way, the possibility of getting pure cultures is greatly aided, and we get rid of contamination from air organisms. Streak plates are then made on blood agar, and ascitic fluid agar, with the platinum needle or loop, and incubated for twenty-four hours, after which the colonies are fished and recovered on slant agar or—as is more often the case with us—on Dorset's egg media, to which a little ascitic fluid has been added. The vaccines are then prepared in the usual way from the pure cultures.

In dealing with furuncle cases we can often recover direct on egg media or agar, without preliminary plating and fishing, as there is not so much likelihood here of contamination. But in the case of subacute and chronic ears that have lasted for some time, we have found it necessary to carry out the above technic. The organisms are identified by all the means at our command, as morphology alone is quite untrustworthy in some cases. This identification by culture and, if necessary, by agglutination tests, etc., takes some days, but we have been in the habit of making up the vaccines at once and using them if organisms are found that are killed by a heat at 55° C. to 60° C. in one hour.

The process just described usually takes two days, and in order that no time be lost in attacking the disease, we give an initial dose of a pure *staphylococcus aureus* or *albus*. This is not the stock vaccine of the market, which is made of mixtures of different strains of bacteria of the same or allied

species, and of uncertain strength and efficacy, but a vaccine made in our own laboratory from at least twenty to thirty strains of *staphylococcus aureus*, *albus*, or *citreus*, isolated at various times from a number of patients who are all suffering from a similar condition, and strains that have been freshly isolated.

When the patient returns for the next treatment, the morphologic classification has been determined as well as the cultural diagnosis made, in the majority of cases. If we find that the offending organism is one of those specified above, and corresponds to the organism of the vaccine used in the first treatment, and if there has been an alleviation of the symptoms and an improvement in the general condition of the ear, we generally continue giving the "home made" stock vaccine. If, however, the organism is of a different type, an autogenous vaccine is ready for use in this, the second treatment. In some cases where the progress of the case has not been satisfactory enough to satisfy, under the use of our own "home made" stock vaccine, an immediate beneficial effect has been obtained when the autogenous vaccine has been substituted. In brief: A scientific diagnosis is made with as much, or even more, care than is the usual physical diagnosis of disease, and it is to this fact that we attribute the success in this fairly comprehensive series of seventy-five cases, with no failure to report.

Why all this care in diagnosis and the selection of vaccine?

Because the function of the vaccine is to stimulate the system to form antibodies and opsonins which combat the disease; and inasmuch as it has been shown that a certain bacterium will produce a certain antibody or a certain opsonin, and that that antibody or opsonin will be effectual against that bacterium and against that alone, it is evident that the vaccine used must contain an antigen the same as the offending organism, otherwise no antibodies or opsonins will be formed and no result will be obtained, unless it may be a possible weakening of the system of the patient.

In Case No. 4, a polyp from the attic filled the ear, and everything was bathed in pus. The condition had lasted for a year, and the patient said that everything had been tried to cure it. The polyp was removed, and fifteen injections, ranging from 250 million to 750 million, were given. The dis-

charge continued until three injections had been given, and then slowly dried up until after the fifteenth injection. For the last six months the ear has appeared normal.

In Case No. 10, a chronic purulent ear with a fistula, through which a probe could be passed in either direction, had lasted for seven years and had been operated upon four times, the last time four years ago. Vaccines had been used at the Army hospital, but did no good. In this case fourteen injections were given. It was a mixed infection, staphylococcus aureus and albus. The pus discharge ceased after ten injections, and the fistula closed after the fourteenth injection. This ear also has been dry for six months.

Case No. 11 was a chronic purulent case, of an indefinite number of years' duration, with radical operation, and a furuncle on the anterior wall and floor. That is a case in which, after giving the patient three injections of what we call our stock vaccines—made in our laboratory—and the progress not being as satisfactory as we thought it should be, we changed to the autogenous vaccine. The case healed up completely after the seventh injection.

Another case was sent down from up the state for a mastoid operation. The doctor up there had come to the conclusion that it was a mastoid and needed operation. We could not detect a mastoid. The patient was a girl who was pretty well along in consumption. She had a large furuncle and large glands over the mastoid which could be both seen and felt. She was given six injections of the vaccine, and kept under observation for a month, to the day, and the glands went down so that one would not know they had been enlarged. Her furuncle cleared up completely, she went back well, and her physician writes that there has been no return of the trouble in the ear, and no enlargement of the glands—even with the tuberculosis going on.

Yesterday, six other cases were discharged cured—one of the most interesting of them being a child thirteen years of age, with a diffuse furunculosis which has been in existence about a week. There had been no previous treatment, and the child suffered a tremendous amount of pain. No discharge. Three injections. The canal was completely closed by a large bladder-like collection of fluid which looked as though it might

rupture at any moment. This was not opened or touched. After the third injection you would hardly know there had been anything in the ear. The condition was completely cured.

It is very interesting to note how the patients will tell us of their own accord, when they come back for further treatment, how effective the treatment is. In a large majority of the cases they say that after six to ten hours the pain ceases.

In one of the cases on the list there was a marked perichondritis which cleared up as well as the furuncular condition.

LIII.

SOME LABYRINTHINE STUDIES.*

BY JAMES A. BABBITT, M. D.,

PHILADELPHIA.

The progress in labyrinthine study has advanced to such a degree in the present day by investigators on both this and the other side of the Atlantic, that the field of scientific work of any original character is a peculiarly difficult one. It had been the intention of the writer to carefully investigate the labyrinthine symptomatology in a series of experimental tests upon seventy-five children who are under his laryngologic and otologic care in an institution for training in speech near Philadelphia, and after securing all possible data on their unilateral and bilateral involvement of the nonacoustic labyrinth, as shown in the various nystagmus tests, to correlate this with their contemporary progress in speech development, motor and sensory acuity, memory retention, reaction time, and congenital traits. A contagious epidemic prevented the completion of this and forced the substitution of a phase of functional study approached from a rather different angle than that of custom, and in a territory which the writer's former collegiate work had given some intimacy. The holding of an institution chair enabled furthermore a rather unique opportunity for experimental observation. The difficulty of controlling experimental material, save in the emergencies of illness, is a positive one, but reasonably accurate observations were taken upon some eighty students—not all coincidently, but adequate for safe deduction. These will be discussed at more length in their proper place.

The purpose of the paper is to briefly outline certain special physiologic phases pertaining to the nonacoustic labyrinth in a study of coordination; correlate, if possible, their reflex,

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cross-educational and psychic influences; suggest their adaptation to the fascinating phenomena of aviation balance and seasickness; present results of functional analysis of some eighty student subjects, and draw some conclusions of suggestive import, if such be possible.

In brief physiologic review, the cristæ ampullares of the three semicircular canals and the maculæ of the utricle and saccule in the vestibule form the end organs of the vestibular nerve which may be traced backward as the mesial root of the eighth nerve to its central nuclei on the floor of the fourth ventricle, which are, as stated by Kohnstamm, Deiter's nuclei, Bechterew's angular nucleus, the triangular nucleus close to the origin of the vagus, and the nucleus embologlossus, referred to by Braun and Friesner as intermediary between Bechterew's nucleus and the central nuclei of the cerebellum. These authorities also make the important allusion to the impulse radiation, between the nuclei of the vagus and the triangular nuclei in the fourth ventricle, as explanatory of the nausea and vomiting associated with vestibular vertigo.

Secondary tracts from the vestibular nuclei pass upward through the pons and down the anterolateral spinal tracts with fibers to the anterior cornua. Fibers to the ocular nuclei are received via the mid-brain, from the small-celled Deiter's nucleus and Bechterew's angular nucleus, and thence reflexly produce the nystagmus phenomena through oculomotor tracts.

According to Bárány, extremity reactions are produced by impulses from the double Deiter's nuclei, thence through corpus dentatum to cerebellar cortex, red nucleus of opposite tegmentum, Monakow's bundle to lateral tract of spinal cord and anterior cornua cells.

Sensory impulses pass from the cord through direct cerebellar to Gower's ascending cerebellar tract. These pass up through inferior peduncle to cerebellar nuclei and then cortex.

According to Braun and Friesner, again, in the cerebellar cortex, motor impulses from the cerebrum meet impulses from the vestibule and sensory impulses from muscles, joints, etc., which have arrived from Flechsig's and Gower's spinal tracts.

This summary has been reviewed to correlaté the various ocular, muscular and vasomotor relationships. It is here to only deal with the balancing elements in the nonacoustic laby-

rinth, hence the lateral division of the eighth nerve will be disregarded.

Ewald states that a tonic influence over all striated muscles is exerted by the static labyrinth. This is proved by experimental extirpation, and Politzer also records subsequent modification increase in cutaneous reflexes. This tonic modification must enter as factor in the functional acuity of muscular action under variations of cerebellar integrity.

It must be admitted that other forces than the static labyrinth involve maintenance of equilibrium. Yet this would appear paramount.

Goltz maintains that the semicircular canals sense the position of the head, and from this body position is established. They determine rotation changes in rapidity and direction, thus controlling equilibrium. Variable opinion obtains as to exact function of otolith membranes; the maculæ perhaps provide orientation of the body in space, after Breuer and Mach.

In rotation the endolymph effort is to regain space relation by accommodation to movement or registering the variation. In further account must also be taken the fact that coordinated movement registers both subjective and objective sensations of movement.

Titchener, in a very careful analysis of the kinesthetic sense, describes this as motor apparatus of body, set in function by bodily movements, which enable us without eye to judge of position. The muscle sense has sometimes been described as a sixth sense, with clear definition from other special sense group, with muscle and tendon end organs; the so-called spindles of Golgi and Pacinian corpuscles or their like, in fascial tissue. The joint synovial membrane and certain periosteal areas transmit sensation of motion and, possibly, the surface of a joint is itself sensitive.

Position, resistance and weight are, perhaps, thus determined in large measure by joint sensation.

The kinesthetic organs of the inner ear which share in this motion sense are different, to the extent that they are under the influence of mechanical stimulation, the result of the wave of fluid passing over, or moving special mass areas. This is a gravitation inertia or centripetal force.

A study of the maculæ and cristæ shows them to be essentially the same in general character—a field elevated from

mucous membrane—in the vestibules supporting small particles of carbonate of lime crystals, and in the cristæ ampullares supporting hair-like processes surmounted with a cupula.

According to Titchener, variation in appreciation of muscle and ear movement lies in the fact that in the first we have highly specialized end organs and no obvious group of sensations to refer them to, and in the ear a mass of complex movement sensations to distribute to available end organs.

The vestibular nerve is largely reflex in function, and by cerebellar connection contracts muscle, keeps the tone firm and tissue braced. Section produces atony, as like section elsewhere of dorsal roots.

With this regulation of muscular tone, influence on reflexes, maintenance of static tension, the decision as to definite scientific function becomes a field of wide variation.

Two phases of function, the ampullar and vestibular sense, may be identified in measure. The swimming after-sensation, secondary to rotation under various conditions, varies with the position of the head and fairly accurately follows the directions of the three semicircular dimensions. Bird experimentation, as cited by Titchener and others, indicates that this sensation, as well as the high intensity vertigo or dizziness, belongs to the cristæ of the ampullares. Injury to these cuts off tonic impulse and further originates abnormal movement which may be, of course, reflex. The four methods of producing reflex eye nystagmus—rotation, cold syringing, electric stimulation, and reflex fistula stimulation—give the primary evidence. Secondary proofs are forthcoming from pathologic, operative and postmortem findings. This is specially evidenced by the findings, postmortem, on deafmutes, with whom nystagmus in over half of the subjects is practically absent.

Similar planed canals act together on both sides of the body; hence any movement of the head must produce rotation result—namely, a lagging behind of endolymph content and bending of cupula.

In complete dizziness we have a most complex situation, which must include not only the endolymph but resistance stop of soft internal components of body, joint kinesthetic sense, etc.

The function of the vestibular maculæ is still a bit uncertain, but the phenomena of the merry-go-round, deep swim-

ming, etc., give assurance of a special coordination sense, aside from the cristæ, negatively demonstrated by their absence in deafmutes.

Perhaps acceleration, positive and negative, in body brings the maculæ into special motion, and that, in quiet, these travel with it.

The explanation of vestibular sense would seem to be in the tardiness or overshortening of otoliths in their position on the maculæ. The two maculæ represent nearly a rightangled displacement in each ear, one moving in a horizontal and the other in a sagittal plane. They are thus displaced on the principle of parallelogram of forces.

The rhythmically recurring reflex stands out strikingly as the manifestation of a really psychic factor—the cerebral education by repetition. The subconscious influence of repeated educational movements is to produce a habit of unconsciously repeating the same. The simple types of the rhythmical reflex, such as walking, the flying of birds, habit semipostural movements, up to the complicated bequest of ability to manipulate fine mechanical contrivances, the file making, Swiss watch manufacture, etc., suggest a coordinate importance from a vestibular side. According to Sherrington, the reflex discharge from nerve cells seems to be rhythmic, even under continuous stimulation. Inasmuch as our study investigates the reflex importance in the vestibular change, the rhythmical reflex may be cited as a condition modified by the labyrinth.

Volkmann, Scripture, Davis and others have studied, in considerable detail, the phenomena exhibited under cross education, in which the training of one organ of the body bilaterally develops the other side. Our tracing of the vestibular nerve and its connections, allusion having already been made to the radiation influence upon the vagus, would evidence the probability that coordinative development, assuming that such may be one of education, should have a cross significance, and that reflex and direct unilateral impress, normal or abnormal in character, should augment or counteract the effect upon its opposite side. In this connection we venture to suggest the possibility of the kinesthetic joint sense, in and around the neighborhood of the middle ear, as being a possible factor in modifying the equilibration. It is clear that fatigue or exhaustion, involving certain centers, may affect those more or

less remotely distant, and a suggestive inquiry might be that of investigation of the constant unilateral use of telephonic vibrations, or, and more remotely, the constant juxtaposition in mechanical employment to machinery sounds and vibrations.

The previous analysis and allusions to the varying motor and sensory connections are cited as a background, to consider the somewhat startling applications of this paper. It is at all times a pardonable fault to place special emphasis upon utilitarian relations of important though rather common conditions. At the present moment we are deeply concerned and interested in the three important phases of locomotion—that by air, by automobile, and by sea.

The writer has taken some pains to investigate the conditions of aviation control—a long and interesting conference with a secretary of the National Aviation Society having greatly stimulated such interest. There are at hand here the records of about three hundred and twenty-five recorded aviation fatalities. This history was searched with but one object in view: to find, if possible, to what extent the loss of equilibrium could be held accountable. Inasmuch as these were practically all fatal, etiology traced to postaccidental conditions present, such as a broken propeller, jammed gear, structural collapse, etc., is not sufficient explanation. To the enthusiast the possibilities of aviation are unlimitable. We can scarcely conceive the meaning of this to us within even the next decade. The query rose to your speaker's mind: "Cannot this in a measure be related to the field of the otologist?" Aviator's sickness is probably in a measure similar to mountain sickness and balloon disease. The most important effects of this are noted in the rapid phases of elevation and descent, perhaps difference in air pressure being mostly accountable. Ten thousand feet in an hour of such altitude has been reached, producing, beside breathlessness and heart acceleration, a special kind of uneasiness, which might be termed "vestibular," and which is associated with crackling and humming in the ears, burning in the face, tendency to sleep and frequently accompanying headache. Movements of the body are sluggish and unskillful; arterial tension is in a measure increased, and it is notable that all these characteristics disappear, both in maintaining a lateral plane of height and upon reaching earth, their greatest effect, secondary to ascent and descent,

being noted when passing near the earth.

Omitting consideration of the cases of death, obviously due to mechanical faults in machinery and to physiologic conditions of the subject or organic character, there remain a very considerable proportion accounted for only by loss of control. These may be, of course, frequently psychic in character, as the loss of nerve, attendant upon continued strain, is a commonly cited condition among aerial performers.

Would this reasoning reach a rational explanation for many of these conditions? In a very simple experiment we have balanced upon the hind legs of the chair. We have, perhaps, practiced this to quite considerable degree. We have then found, possibly, that at some unconscious moment, with attention directed to other phases, we have been balancing quite an appreciable time without our knowledge. Like the precipitous effect of a lemon squeezed before a street band, we have noted, on occasion, the sudden loss of equilibration or coordinated control during intricate exercise, when the exhibitor's attention has been attracted by some condition in the audience, the action of another performer, or recognition of friends.

Furthermore, a study of the psychologic phases of the subconscious condition assumes in the individual, not only a perfect memory reaction when stimulated under hypnotic suggestion, but also the fact that balance, like other educated movements, becomes the result, subconsciously enacted, of repeated educational efforts for equilibrium. Jones, in his excellent treatise, demonstrates the habit of courteous social presence to be the result of repeated educational courtesy acts, finally enacted subconsciously. A musician becomes a skillful musician through repeated practice hours, on a definite routine; skilled artisans by similar methods.

The failure to demonstrate the full attainment of such grace, musical ability, or skillful craft occurs only when self-consciousness confuses the result. The marginal frame of the extraconscious is drawn upon repeatedly in conjunction with volitional act. Most of our acts are not guided by directly conscious intent. The greater group is a mass accumulation of habit impulses.

The aviator, as the balancer in the chair, educates himself to a regular rhythmical coordination, attuned to his machine. His "lift" or lightness, in a measure, might simulate the ecstatic

type of lift we feel, under the influence of subordinated self-consciousness occasioned by beautiful music, superb art, stimulating odors, etc. His machine's balanced glide continues, under the influence of the subconscious accommodation of his vestibular sense to the conditions of flight. The suggestion of importance that your speaker would make here, is the possible influence of the other portion of the labyrinth—the acoustic portion. The dull, steady, monotonous vibration of the motor would tend to absorb, through reflex transference, other special sense activity. Is it not reasonable that conditions, such as are noted above, perhaps in four or five of the great flight catastrophes of this country, have called attention aside from this monotonous and consistent adaptation and introduced a self-conscious direction which has destroyed control? The query arises as to whether a deteriorating functional activity of the vestibular canals, the possible influence of a deeply thinned tympanic cavity and deficient circulation, may prove an important complement in the qualifications for safe aviation.

Seasickness has been studied by nearly every labyrinthine investigator, and in a recent publication by Byrne, based upon eight-hour trips with careful observations, he cites slight elevation in blood pressure, variations in arterial contractions and pulse rate of minor character. He makes the emphatic statement that disturbed circulation and gastric elements are not primary. Psychic imagination plays a certain part; but the sickness is absolutely analogous to the aural results on circulation and digestion, as well as the rest of the organism, caused by rotation, caloric fistula and galvanic tests. Closure of the pylorus and lowered acidity are identical with the phenomena observed in rotation due to the aural irrigation.

In reference to the third type of locomotion, the automobile, as in rapid train service, it is somewhat difficult to get accurate detail as to vestibular relation. Instances have been cited in which meningeal complications have ensued from high speed locomotion. It would seem reasonable to assume that the effect of this would either be to accustom the coordinated sense to such rapidity or to produce a form of devitalizing from overstimulation. Changes in this may be those of a generation rather than brief epochs in time.

Stimulated by the interest of the foregoing observations, the writer made a series of tests, as noted in the introduction of

the paper, upon some eighty students, in an effort to substantiate the correlation between vestibular reaction and certain other vital indices. The physical education field presents a certain opportunity for studying this correlation, and these tests were taken in connection with some distinctive gymnastic exercises.

First, a careful grouping was made of those men showing marked nystagmus reaction in the ordinary horizontal rotation tests. This test was taken with a Phillips rotating chair, with the head in proper position, using opaque glasses and with a two-second rotation for ten turns. The estimate of nystagmus was both upon time interval and degree of response.

In the eighty subjects' six other sets of data were obtained—namely, the balancing test, a coordinated aerial test, a general gymnastic exercise rating, a grading of general mental coordinating reaction, a blood pressure test, and a pulse rating. The balancing, apparatus and coordination tests were estimated by Mr. K., the chairman of the intercollegiate gymnastic judging, and taken without knowledge of the nystagmus results. As indicated in the chart, a rather interesting set of averages was obtained.

The central dividing line indicates the general average of nystagmus duration of the eighty subjects. In the first column is put, above, the average of duration of the twenty highest subjects, and, below, represented by the dotted line, the average of the twenty lowest. The times are rather high to include full reaction, and rate above customary period in average.

In the second column, the balance tests, the results brought both groups to nearly the same spot. These balances could only be a general judgment and by a classifying decision.

In the third test—the aerial coordination—the brief duration nystagmus group stands considerably above the average line, but the high reaction group falls below.

In the general gymnastic efficiency, judged by complex apparatus standards, the lines parallel about the same, though both are below the average.

In the coordination test there was the same relative average as in the preceding.

In the sixth column the lower nystagmus group ran below in blood pressure, and remained below in the pulse rating.

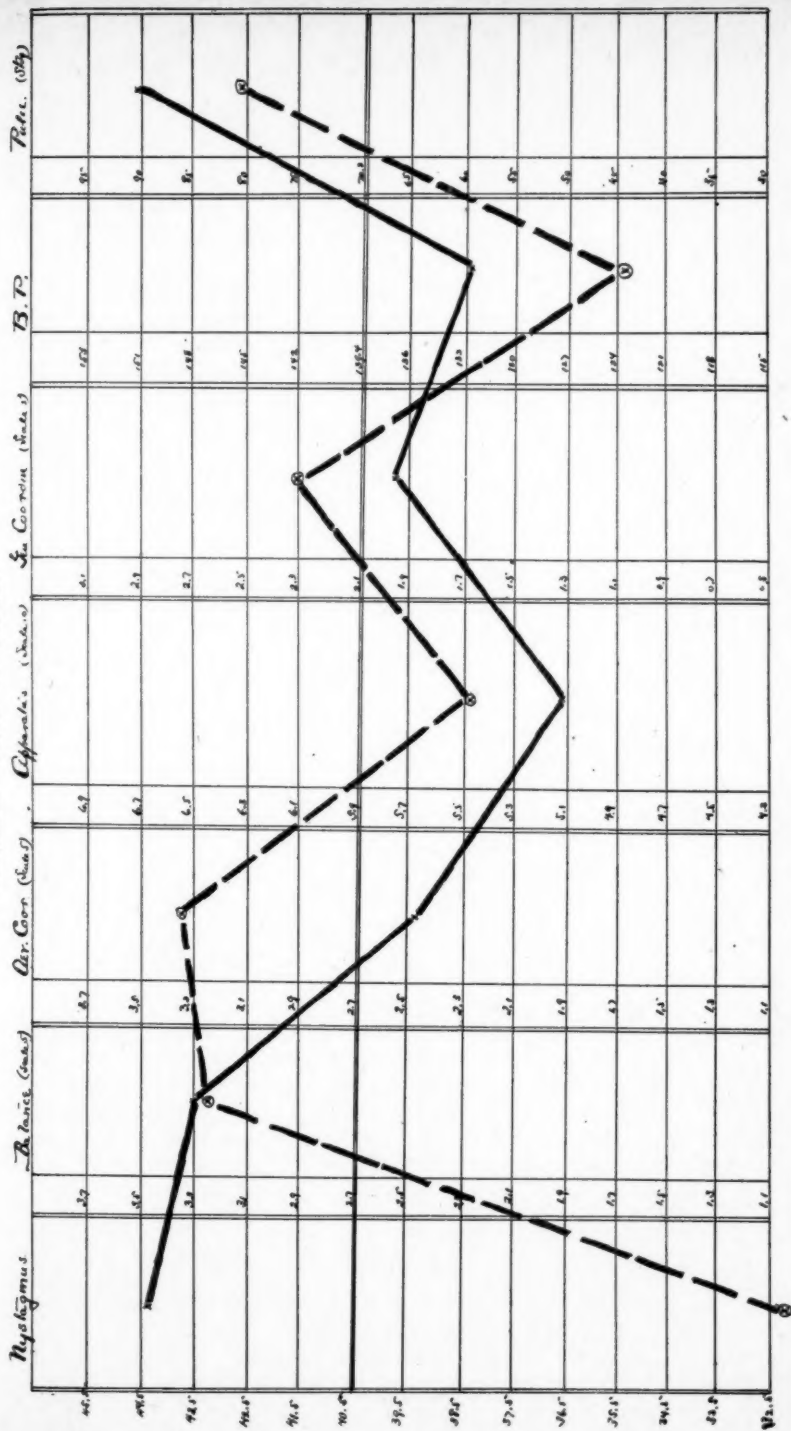
The averages are not in sufficient number to more than indi-

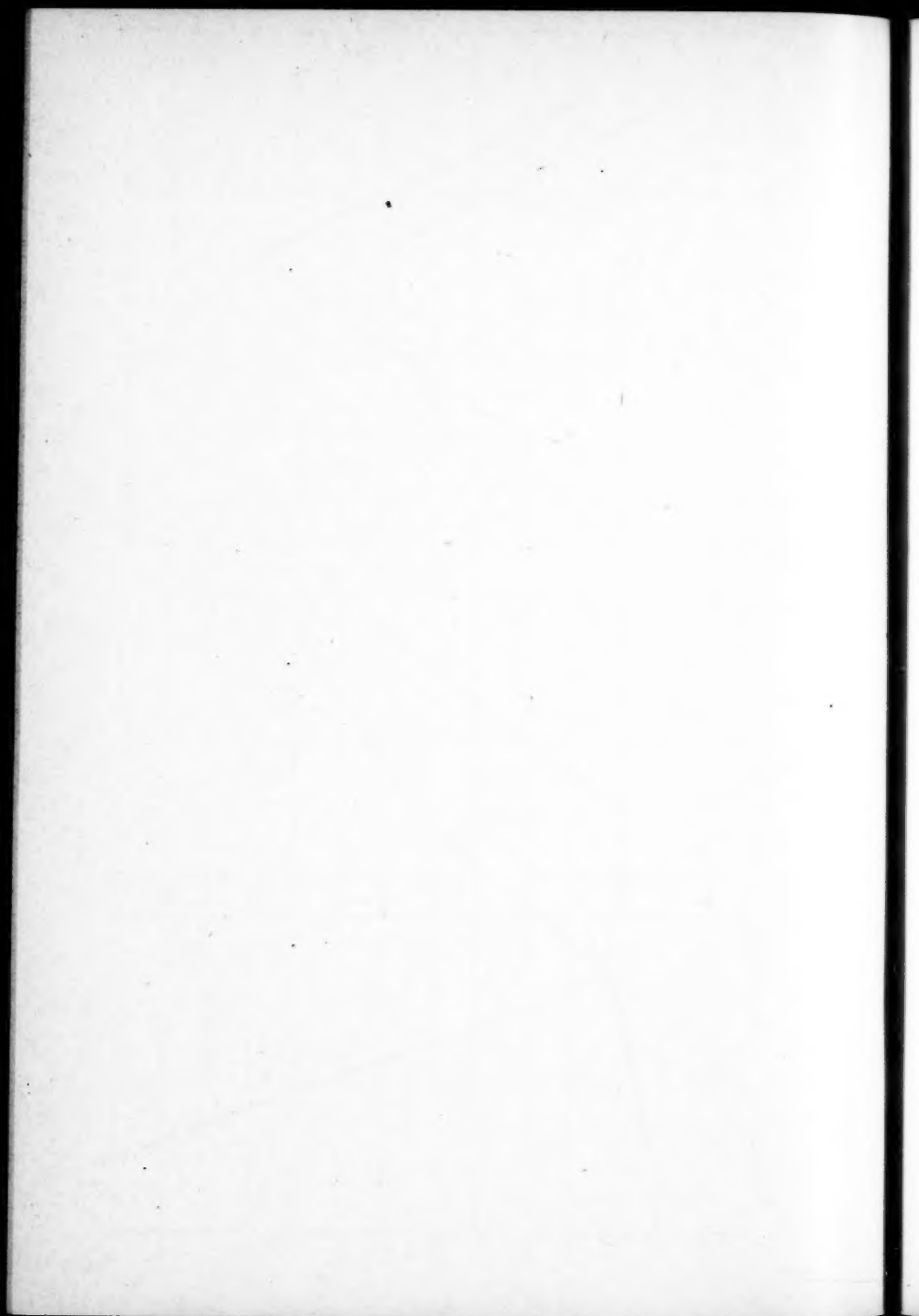
cate; but, as an indication, they come out surprisingly in accord with our judgment, and they are freely recorded as one contributory series of tests.

Tersely expressed, in this series of tests an effort was made to determine several facts which might be interpreted in the form of these queries: "Is the rotational evidence in the semi-circular canal in any way an index of other functional characteristic?" "Are rotational types of exercise advantageous or disadvantageous to special sense reactions?" "Is there a correlation between the nystagmus test and estimated evidence of coordinating ability, balance movement, height equilibration, etc.?" "Will the regular practice of rotations in physical development bring about a resistance to height, swift movement, and similar disturbance?" "Is there any relation between circulatory rate, blood pressure, and vestibular conditions?" "In how far does the psychic element in ordinary body movements act as a controlling feature?"

The writer would establish no conclusions from the above except as are suggested by the chart. In the group of tests taken, general coordination was distinctly higher in those who revealed the lower nystagmus after-result, and the averages of pulse and blood pressure were also below. These results are simply presented as one very minor contribution of effort in a most interesting and instructive field of work.

GENERAL CURVE OF TESTS.





LIV.

PEMPHIGUS INVOLVING PRIMARILY THE MOUTH
AND THROAT, WITH REPORT OF CASES.*

BY ROBERT SONNENSCHN, M. D.,

CHICAGO.

Although the typical lesion of pemphigus is the vesicle, it is difficult, according to Bettmann, to apply a single term to the many forms of the disease, and he suggests that the name be used to designate pemphigus vulgaris and its most closely allied variations. This condition may be acute or chronic in its course, and is of an unknown etiology. Some claim that there is a certain connection with changes in the atrophic nerves. Hyde states that "Pemphigus is more frequently seen in males and mainly during infancy and childhood. It often occurs in debilitated individuals whose resistance has in one way or another been greatly impaired."

Since we are concerned with cases occurring primarily on the mucosa of the mouth and throat, no very extended attention will be given the discussion of the lesions usually found on the skin. On the oral mucosa and that of the upper respiratory tract, chronic forms of pemphigus are, according to Trautmann, fairly often found, but the acute cases are quite unusual, and, according to Moritz Schmidt, exceedingly rare. All of the many forms of pemphigus, such as the vulgaris, circinatus, foliaceus, gangrenosus, hemorrhagicus, serpinatus, etc., may appear on these mucosæ.

Owing to the constant maceration and other unfavorable conditions, vesicles in the mouth or pharynx seldom reach the characteristic form seen on the skin. There soon occurs a partial or complete elevation of the epithelium before a visible vesicle is formed. There is also a more extensive fibrin formation on the mucosæ than on the skin, so that instead of a

*Read before the Chicago Laryngological and Otological Society, March 17, 1914.

fluid exudation there is a fibrinous one. When the oral mucosa is affected by the pemphigus, circumscribed areas showing cloudy epithelium and whitish gray exudate appear, resembling somewhat diphtheritic membranes. This condition may persist for some time, or the exudate may separate in a few days, leaving sharply outlined red areas having a glazed, varnished appearance. As some of these lesions heal, others appear. In a word, pemphigus on the mucosæ shows not intact vesicles, but ragged, gray white, macerated membranes, smooth, red or granulating erosions. There may be thickening of such structures as the epiglottis, true or false cords, or at times ulcerations, which later produce scars and distortions. Moritz Schmidt says that among the latter results are adhesions between the soft palate and posterior pharyngeal wall. At times stenosis of the laryngeal orifice may ensue following contraction of the scar tissue.

The pemphigus lesions may be located anywhere in the mouth and upper respiratory tract without any special predilection. As a rule, however, the process spreads from the mouth downwards into the pharynx, larynx, or even trachea and bronchi. If the pemphigus on the mucosa is extensive, very unpleasant, at times agonizing, symptoms arise, such as pains, difficulty in swallowing, salivation, fœtor ex ore, etc. While practically all the various mucosæ of the body may be affected, it is the lesions in the mouth, pharynx, larynx and trachea that interest us most. The general symptoms vary greatly, but may show itching, disturbance of appetite, occasional edema, profuse diarrhea, later cachexia, and death. The latter is sometimes due to some intercurrent disease.

As regards the skin, the vesicles of pemphigus vulgaris develop, according to Bettmann, rather rapidly upon a previously normal epidermis, are usually not preceded in their appearance by any changes such as hyperemia, urticarial swelling, etc., and are devoid of an inflammatory zone. While there are often marked differences in the size of the lesions on the same patient, the form is usually very regular, namely, circular, and there is no tendency to confluence. The contents of the vesicles are usually clear at first, but if involution occurs the fluid becomes turbid, the bleb gets less tense, dries and produces crusts, the removal of which leaves for some time a reddened area and at times a brownish pigmentation. Healing

results without scar formation, even if the vesicles are torn and not allowed to run the above course. At times the blebs have a bloody content, but decided hemorrhages (pemphigus hemorrhagica), or marked destruction of tissue (pemphigus ulcerosus, etc.) are rare.

The duration of the condition varies greatly from a few months in the acute forms to many years in the chronic. While no definite prognosis can be foretold in any one case, certain factors seem to influence the course of the disease. In the young the pemphigus is, as a rule, more favorable than in those of advanced age. Pemphigus foliaceus and pemphigus vegetans give an especially poor prognosis, resulting, as they usually do, in early death. Most authorities, such as Neumann, Neisser, Mickulicz and Kümmel, etc., agree that involvement of the oral mucosa (as well as the nasal) usually points to death within a few months. The primary or early appearance of pemphigus lesions in the mouth or throat is thus an indication of the malignant nature of the case.

The diagnosis of pemphigus of the mucosa is, according to Schech, difficult only when vesicles are not at the same time present on the skin. The rapid changes in the appearance of the lesions, the healing in one place with development of new areas in another spot, are, together with a history of pain in the mouth and throat, loss of weight and strength, quite characteristic. Chiari says that while it is difficult to find the actual blebs (especially in the larynx), since they often burst within fifteen minutes after formation, still one can at times find a piece of the pellicle and thus make the proper diagnosis.

In the differential diagnosis lues, herpes, and a number of other conditions must be considered. Luetic ulcers of the upper respiratory tract are deeper and have more sharply outlined edges if of a gummatous nature. Mucous patches are smooth, white, thin, show spirochetes, and have, as a rule, no red border. According to Trautmann, it is largely the history of the case, the absence of other syphilitic signs, the futility of antiluetic treatment, the presence of fever in the acute cases, the occurrence of vesicles on the skin, the superficial character of the lesions and the absence of infiltration which differentiate pemphigus on the mucosa from syphilis.

Moritz Schmidt claims that ulcerations due to the use of

chromic acid in the pharynx greatly resemble pemphigus lesions.

Differentiation from leukoplakia must be made. This condition is chronic and does not change from day to day; it consists in an increase and hornification of the epithelium, not a loss of tissue or a false membrane formation.

Herpes of the mouth and aphthous stomatitis (considered by some identical) usually show smaller, round lesions, are usually very acute, often show a history of previous attacks, and do not, as a rule, seriously affect the general health.

Last, but not least, one must remember diphtheritic involvement of the mouth or pharynx. This condition produces the grayish, adherent, characteristic membranes, shows the Klebs-Loeffler bacillus, runs a very acute course, and is usually at once favorably influenced by the antitoxin.

The treatment of pemphigus in general is very unsatisfactory. Arsenic has been largely used, and recently salvarsan has been tried. For the lesions in the mouth and throat mild cleansing and disinfecting washes containing hydrogen peroxid, etc., are indicated. At times astringents or preparations such as silver nitrate, tincture of iodine, etc., may be applied.

Case 1.—For the notes as well as the permission to report this case I am deeply indebted to the kindness of Dr. George Rubin, whose patient she was. Mrs. L. S., aged sixty-two years, housewife, Russian Jewish, entered Maimonides Hospital, October 28, 1913. Family and previous personal history unimportant.

Present Condition.—The symptoms complained of began about eight weeks prior to her admission into the hospital, and two days after she had undergone some dental work. There first appeared a small, so-called "pimple" near the right angle of the mouth on the inner side of the lower lip. In a day or two there were several lesions in the mouth. These were followed by a few blisters the size of a half pea on the abdomen near the groin, and later on the arms. The diagnosis of pemphigus was confirmed by Drs. Joseph Zeisler and Joseph S. Eisenstaedt. The time between the occurrence of the lesions in the mouth and other parts of the body was not definitely noticed by the patient. Similar blebs developed rapidly on the feet, especially on or near the toes. Some vesicles were as big as a half cherry, and some even larger; they would burst,

form crusts and some would weep. The temperature at first ranged about normal, but later rose at times to 100° or 101° , but never reached 102° . The eruption continued in the mouth throughout the illness. Three weeks prior to death the larynx became involved, showing patches with exudate and producing aphonia. The latter condition lasted a few days, then the patches partially healed, and the voice became clearer and stronger. The eyes were also seriously involved towards the end. The blood, urine and other excreta were normal. Cultures of the secretion from the blebs gave almost a pure culture of staphylococcus. Two salvarsan injections were given about the middle of the course of the disease, but without any apparent influence. Death occurred within six months of the onset of the disease.

Case 2 was seen by the writer. Mrs. H., aged thirty-eight years, American, housewife, was referred by Dr. A. H. Fowler, October 19, 1911. Before and during her last pregnancy, two and a half years previously, the patient had "nervous exhaustion" and a severe nephritis; following labor there was a phlebitis. Eight weeks before seeing her she began to have pain in the throat, especially on the right side. Had a prickling sensation, particularly when eating ice cream. About the middle week of October blood was on several occasions expectorated.

Examination showed a rather frail, pale woman, with hemoglobin of eighty per cent. The nose was negative except for a few small erosions in the anterior part of the septum. The gums seemed to be the seat of a marked pyorrhea alveolaris. The nasopharynx was negative, but the oropharynx showed a number of patches with red zones covered by a white rather ragged exudate which could be fairly easily removed with cotton applicator, leaving an eroded area. No actual vesicles could be seen. Smears from the false membranes showed various diplococci and bacilli, but no spirilla. The salivary glands and many of the cervical lymph glands were enlarged.

The Wassermann test, made by Dr. F. G. Harris, was negative. Silver nitrate (five per cent), tincture of iodine and potassium chlorate mouth wash were at various times used. Owing to the pyorrhea, the patient was referred to a dentist and the gums treated. The latter as well as the pharynx showed marked changes in condition; on certain days there

was apparently great improvement, with healing of many of the lesions, but a few days later numerous other ones would appear. Drs. W. A. Pusey and A. W. Stillians diagnosed pemphigus, even though no vesicles had as yet appeared on the skin.

Towards the end of November, 1911, white patches similar to those seen in the pharynx appeared on the epiglottis, false cords and posterior laryngeal wall. The true cords were injected and hoarseness was present. January, 1912, the intestinal mucosa apparently became involved, as evidenced by pain, distress, diarrhea, etc. Then vesicles appeared on the skin, the patient became much emaciated and died, February, 1912, six months after the onset of the disease.

SUMMARY.

Both of the cases cited began in the mouth, the writer's case showing more intense and more diffuse lesions extending from the lips into the trachea, and probably into the gastrointestinal tract. In this case there was a distinct history of nervous exhaustion, nephritis and phlebitis following pregnancy two and a half years previously. Both cases died within about six months after the first lesion appeared in the mouth.

CONCLUSIONS.

1. Acute pemphigus is of rather unusual occurrence.
2. The early appearance of lesions in the mouth and throat gives an exceedingly poor prognosis.
3. Treatment is of little avail in either acute or chronic cases, the former usually dying within a comparatively few months.
4. In the differential diagnosis quite a number of commonly seen diseases must be considered.

29 East Madison St.

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SOCIETY PROCEEDINGS.

REPORT OF THE SCIENTIFIC PROCEEDINGS OF THE THIRTY-SIXTH ANNUAL CONGRESS OF THE AMERICAN LARYNGOLOGICAL ASSOCIATION.

HELD IN ATLANTIC CITY, MAY 25-27, 1914.

Address of the President—The Air We Breathe.

BY THOMAS HUBBARD, M. D.,

TOLEDO.

During the period 1825 to 1875 the standard of temperature of dwellings and public places was gradually increased from 55 degrees F. to 72 degrees F. There was no attempt at corresponding increase of humidity. Fifty-five degrees with natural ventilation implies about 40 degrees relative humidity; 72 degrees F. gives a natural humidity of 20 per cent or lower. From the health point of view the 20 per cent decrease in humidity is more important than the 15 degrees rise of temperature.

Catarrhal and acute infections are more prevalent during the cold months to a degree not creditable. Abnormal dryness of the air of our habitations is a factor worthy the attention of hygienists. Dry air is a dust laden air—and an infection disseminator. Moist air causes precipitation of dust content, and a proper humidity lessens dangers of air borne infections.

The caloric shock of sudden change from 70 degrees and 20 per cent relative humidity to outdoor air 30 degrees, 80 per cent relative humidity (average winter condition), causes chronic congestion and inflammatory reaction in air passages. Chronic pathologic changes in mucosa and turbinates follow. Unhealthful atmosphere

of our habitations is the ever present etiologic factor in winter catarrh.

The difficulty of humidification lies in the high temperature standard. Almost impossible to moisten air up to 50 per cent relative humidity and at the same time ventilate. Problem simplified at 65 degrees with 40 per cent relative humidity. Sixty-five degrees F. with 40 per cent relative humidity feels as comfortable as 72 degrees F. with minus 20 per cent relative humidity. Sixty-five degrees F. is the "critical point" in heating air. Fuel cost increases very rapidly above that. There is a positive natural resistance above 65 degrees. To heat air from 60 degrees F. to 70 degrees F. costs as much in fuel as to heat it from 20 degrees F. to 60 degrees F.

Sixty-five degrees F. is the natural temperature standard for habitations. In so far as we are habituated to a temperature above that, we are that much hypersensitized to temperature, and consequently more subject to caloric shock—and further, health and economy unite in demanding a revision of heat standard downward, in order that a healthful humidity standard, 40 to 50 per cent, may be made practical.

Ventilation is important, but there is such a thing as too much ventilation. When air of dessicating, unhealthful quality is introduced in volume sufficient to change the air of a building two to four times an hour (the minimum rate to get proper distribution of heat), it is virtually a dry kiln effect, and the more rapid the change the lower the humidity. For example: Furnace heated school rooms are gradually brought down to considerably below 20 degrees relative humidity (14 per cent in one test), and no amount of so-called "fresh air" without artificial addition of moisture can offset the deleterious effect of the abnormal dryness.

The average winter relative humidity of the North Atlantic and Middle States is near 80 per cent. This condition makes it all the more important that we give special attention to "conditioning" the air we breathe up to a tonic healthful degree of humidity.

Engineers and architects are prepared to meet any reasonable demand, and it is our duty to aid in educating toward establishing proper heat and humidity standards.

DISCUSSION.

DR. JOSEPH H. BRYAN, Washington: Physicians postpone taking up this very interesting subject, contenting themselves with treating the pathologic conditions that take place in the upper air passages resulting from vitiated air, rather than educating their patients how to live in an atmosphere that is not only comfortable but healthful.

I agree with Dr. Hubbard as regards the temperature of our living rooms; 65 degrees seems to me the maximum—anything above that increases the sensitiveness of the individual. It is a notorious fact that we in America indulge in too much heat in our homes. The only other nation that lives in such hot houses is the Russian. Foreigners coming to this country to live for the first time almost universally complain of the great heat of our houses. Humidity and temperature are so intimately connected that they cannot be considered separately. As Dr. Hubbard says, a temperature of 65 degrees with a humidity of 40 degrees will be as comfortable as a temperature of 72 degrees with a humidity of 20 per cent. These are simply opinions, and must be verified by more extensive observations before they can be accepted as a standard for the sanitary engineers to go upon in supplying our homes and public halls with the proper atmosphere.

How are we to arrive at the proper conditioning of the air we breathe so as to produce an atmosphere that is conducive to health? It can only be done by the medical profession joining forces with the sanitary engineer. The engineer is prepared by the many devices at his command to produce any kind of air that is desired. He, however, has not been able to bring about the desired results because there is no uniformity of opinion in the medical profession as to what kind of air is the best for the health of the individual. We have been too slow to take up and investigate this most important subject. When this is done and a uniform opinion formed, there then remains for us the all important duty of educating our patients how to live in a healthful atmosphere.

DR. JOHN F. BARNHILL, Indianapolis: We all see this class of case, namely, one which cannot endure a temperature below 70 degrees without great distress. These cases

have been, in my practice, usually those of ethmoiditis; when they go into a lower temperature and are inactive, they will have fits of sneezing, watery discharge, discomfort, cold feet, and distress in general. For a long time when I saw that class of case I thought possibly there was something psychic about it, and tried to dissuade them from their feeling that high temperature was the proper thing. About two years ago I began to have the same condition myself. When I would sit in a room less than 70 degrees I began to sneeze, had discomfort and all the symptoms which I have just related. I could not sleep in a room where the temperature was less than 65 degrees without waking in the morning with great distress. On examination by a rhinologist I found I had small polypi and a beginning ethmoiditis, and when these were cured I could again live in a lower temperature without discomfort.

DR. HENRY L. SWAIN, New Haven: I would like to put a question to Dr. Hubbard. I do not understand which method he recommended for bringing up the humidity of any given house or room to a desirable state. It must be that what he says is true, because if we are stimulating the physiologic functioning of our nasal mucosa from both outside and inside, moistening the air to our lungs, we must be making a physical stimulus sufficient to produce an hypertrophy to intensify any tendency to hypertrophy in such a nose.

DR. CHARLES W. RICHARDSON, Washington: Some years ago I talked to the chief of the Weather Bureau, and he brought to my consideration the question of increasing the humidity and lowering the temperature as being the most comfortable for living purposes. He explained it so thoroughly and satisfactorily that ever since then I have been having my waiting room uniformly at 60 degrees with 40 per cent humidity. There is one thing in that connection I would like explained. It has been a question with me whether I should not increase the temperature a little, for I find that most of my patients, or at any rate a number of them, speak of the coldness of my hands. I feel perfectly comfortable, not at all cold. I never have any affection of the upper air tract. I think another interesting point

brought out is the cry of nature against this lowered humidity and high temperature. I have always had a hobby for old furniture, and, as you know, a great deal of that is not nailed but riveted with wood and glue; and I have often noticed when our temperature was high how we could hear it crack and warp. The joints would open up. But since we have been keeping the temperature lower and the humidity higher this crackling has ceased.

DR. EMIL MAYER, New York City: I would like to ask a question of Dr. Richardson. What effect do your patients find in coming into a room kept at 60 degrees when they are not accustomed to it?

DR. RICHARDSON: Some complain about it, I must confess.

DR. THOMAS HUBBARD, Toledo (in closing): In regard to Dr. Bryan's conclusions that 40 per cent to 60 per cent relative humidity is the healthful standard, I think most engineers believe that anything above 50 per cent is impracticable, especially with regard to the question of condensation of moisture on windows and in cold weather the frosting, which must be taken into consideration. It should also be mentioned that when the occupants are undergoing physical exercise they can stand only from 45 per cent to 50 per cent; when engaged in a sedentary occupation they can stand more. The discomfort of foreigners is really due to the change in humidity, not to the temperature. I want to emphasize the indirect system of ventilation which is largely responsible for the changes in the humidity; the colder the weather the less moisture in the atmosphere or fresh air you take into the furnace, and the more rapid the change in the air of the house the more rapid is the lowering of the standard of humidity. The modern system is a combination of direct and indirect—direct for the heat of the room, and indirect for a moderately rapid change of air or temperature of the room.

With reference to Dr. Richardson's statements, I would consider that 60 degrees is too radical a change for most of us, because we are so accustomed to 70 degrees, even with a humidity of 50 per cent. Ultimately we will regard 60 degrees as a standard to be obtained, just as now we consider 65 degrees, but at present it is too sudden a drop for most people from 70 to 60 degrees, and there would be more or less positive physical discomfort.

Primary Lupus of the Larynx.

BY EMIL MAYER, M. D.,

NEW YORK CITY.

Three cases of lupus of the larynx, two of them primary, had been under the writer's care during the past year.

As he had presented this same subject seventeen years previously to this Association, opportunity was afforded for a comparison with the viewpoint then existing, as also of noting the progress made in the diagnosis and treatment of this affection.

The total number of cases of primary lupus of the larynx recorded in the literature up to the present time, including the two here presented, was thirty-five, indicating the rarity of this affection, which was first described by Ziemssen in 1876.

It was perhaps noteworthy that the two cases presented by the writer in his former communication were of primary lupus of the larynx in their earliest stages, and were observed for many years; while the two here presented were in the later stage of the disease.

Lupus of the larynx is a chronic disease with but the slightest symptoms, is often accidentally discovered, and the prognosis as to life is relatively good.

The distinctive appellation of lupus should be maintained; primary lupus of the larynx, though rare, does exist.

DISCUSSION.

DR. J. PAYSON CLARK, Boston: The case which I saw recently is very interesting—that of a young woman, twenty-four years of age, who was sent to me by a skin specialist. She first discovered, somewhat over a year ago, a small red spot on the left cheek, just about the angle of the mouth; she showed it to a local physician, who made light of it, so she forgot it; but last fall it had increased somewhat in size, so she went to a dermatologist in Boston. He was not able to make a diagnosis, but kept it under observation until early in February, when he decided it was lupus. Then a little later she was a little hoarse, and

he thought there might be some lupus of the throat, so sent her to me. I discovered on the left side of the posterior wall of the pharynx, and involving the left posterior pillar, a pale nodular mass which had all the typical appearances of lupus. On examination of the larynx I found the epiglottis swollen, pale and nodular, and this same condition extended down to the aryepiglottic fold, and the arytenoids were somewhat enlarged. This patient was apparently in perfect health, well developed, of splendid color; lungs examined and give no sign of any trouble. What am I going to do with this case? Of course, if this condition existed only in the spot in the pharynx, I could curette it and cauterize it thoroughly, but I do not feel that by removing the epiglottis I will cure the trouble, because if you see an epiglottis infiltrated in that manner, you will know that the process microscopically has probably extended considerably further, and if you remove the epiglottis you will have no surety of removing the whole disease. Probably the aryepiglottis and arytenoids are also affected.

DR. WILLIAM E. CASSELBERRY, Chicago: I was about to ask Dr. Mayer if he would not, in closing the discussion, go a little more into detail with respect to the first case. I do not doubt the correctness of his diagnosis, but I feel I would have made a mistake and called this tuberculosis of the larynx. In a man with advanced pulmonary tuberculosis, with cavities, etc., and with enlargement of the larynx and nodular enlargement of the epiglottis, even though not associated with much pain, I am sure that I have seen just such cases in both advanced and incipient tuberculosis, which I have included in my cases of tuberculosis of the larynx. I know that there is a clinical distinction between lupus and tuberculosis, both with respect to the skin and the mucous membrane, and I do not doubt that we can have the two conditions combined, just as Dr. Mayer has led us to infer was the case in his patient.

DR. HENRY L. SWAIN, New Haven: I would like to ask Dr. Mayer what has been the result in these cases, of tuberculin used along modern methods, as in cases of tuberculous laryngitis? In speaking of the marked bene-

fits from superheated air, do you use the suspension laryngoscope?

DR. HERBERT BIRKETT, Montreal: Some years ago I reported before this Association a case of primary lupus of the pharynx, and at the same time mentioned a case of lupus of the nose which was found only accidentally to have involved the larynx. These conditions were definitely found to be lupus, first from the presence of the bacillus, secondly from the local definite reactions to tuberculin, and finally from the transmission of the disease to guinea pigs. The lungs in both cases were absolutely negative, for the use of tuberculin would have awakened any latent focus had any existed. The treatment instituted in both cases was the X-ray. In spite of the local treatment which I had carried out, it had resisted treatment until the X-ray was used, which was accomplished by means of a lead tube dropped into the pharynx and down to the larynx, allowing of direct application. Both cases got absolutely well.

Recently, within the past six months, I have seen two cases of primary lupus of the nose, both of which have made complete recoveries under radium. In one case the specimen was definitely pronounced by the pathologist to be carcinoma; this was very curious, for two specimens were sent to the pathologist at different times, without his knowing they came from the same patient, and he returned the same diagnosis for each. The physician in charge of the X-ray department, Dr. Perry, pronounced them locally to be cases of lupus.

DR. EMIL MAYER, New York City (in closing): Regarding the diagnosis in the first case: The man was brought to me by his physician, who was a very good observer, with the very thoroughly elicited history of having a complaint of only seven weeks' duration. His story was that over four years ago he had a cough, for which he was treated, and then remained well, and yet at the time of examination there was this tremendous infiltration and destruction in his larynx; a condition which must have been of very long duration and for which this man had absolutely no complaint. It seemed to me from the nodular excrescences, the absence of all previous bad conditions,

together with the absence of dysphagia and its slow process, for it was discovered only when the tuberculosis of the lung had become apparent, because the man had been in such surroundings that his history would have been brought out quite early if he had anything of the sort, that it was entirely proper to place this case solely in the catalogue of late appearance of lupus of the larynx, beginning there and eventuating in the lung. And as the second case was without lung involvement and no great infiltration and destruction had occurred, I felt justified in putting both in the same category. It is possible that this is one of the cases we meet when we investigate cases of arrested tuberculosis. The point has been brought out by Dr. Birkett and Dr. Clark, that lupus of the larynx is an accidental discovery.

I would say, as regards tuberculin treatment, it has been used extensively, particularly by Blumenthal, Edmund Meyer, and others, and they extol it very much, used carefully and in the manner indicated. The old tuberculin is used in all instances, the new tuberculin not being used because of the danger of edema.

Superheated air is claimed to have good results by laryngofissure, and it was one of the methods of treatment which was suggested, using the Killian suspension apparatus.

As regards the helplessness of our treatment, it does seem rather peculiar to speak of the treatment of a disease of slow progress which causes the patient little or no discomfort. As regards any treatment which is instituted—and we may have to go from X-ray, radium, superheated air to this new method of Pfannenstill, of the direct effect of iodine—the whole endeavor should be to inhibit as far as possible the insidious progress of this disease.

Primary Sarcoma of the Trachea.

By J. M. INGERSOLL, M. D.,

CLEVELAND.

A case of sarcoma of the trachea in a man, thirty-two years old. The patient had a persistent, troublesome cough for several months, and during this time he had had three

very severe prolonged attacks of paroxysmal coughing. In each of these attacks he had finally coughed up and expectorated what he called a "polyp." He corroborated this statement by showing me the polypi which he had expectorated. They were irregular, slightly nodular masses. The smallest one was about 1.5 centimeters in diameter, and the largest one was 3 centimeters long and 1 centimeter thick, tapering down to a small pedicle at one end.

His larynx was inflamed, and on the left side of the trachea, just below the first ring, there was a pedunculated tumor, quite similar in appearance to the largest one which the patient had expectorated. At this time there were no indications of any involvement of the tissue around the larynx and trachea.

Microscopic examination of the tumors showed them to be spindle celled sarcoma. External operation was refused at the time by the patient, and later, when he consented, the growth had already extended beyond the larynx and was inoperable. Thirteen weeks later the patient died; no autopsy was permitted.

DISCUSSION.

DR. D. BRYSON DELAVAN, New York City: The question of malignant disease of the trachea is especially interesting because of its hopelessness. I have seen a number of cases of malignant disease and of nonmalignant growths of the larynx treated by means of radium in the hands of at least one of the most expert users of radium in the world, and he found it extremely difficult to make the proper exposures of the radium to the growth. If that be the case in the larynx, the difficulties in the trachea are increased, even though the applications be made through an incision in the trachea. The use of the X-ray, while palliative and beneficial to a certain extent, we admit is powerless to cure certain types of growth. That brings us back to the chemical treatment of malignant disease. In the case of malignant disease of the trachea, some combination of remedies worked out in the future is to be the sovereign resource, rather than surgery.

DR. CHEVALIER JACKSON, Pittsburgh: I think we are indebted to Dr. Ingersoll for reporting this case, because

of the very great rarity of this affection, if we exclude from consideration the malignancy of the trachea which is an extension downward from the larynx or upward or inward from the mediastinum. In my own experience I can recall but a single case, and even here I cannot be sure it was primary in the trachea. I have seen a large number of cases of malignant disease of the trachea, but always as an extension. There was one case where we felt justified in considering it was primary.

I also agree with Dr. Delavan in the hopeless outlook. I cannot imagine the possibility of the cure of even a very small primary malignancy in the trachea, when we consider the fact that it occurs, as Dr. Ingersoll says, on the posterior wall, which we know to be full of lymphatics, and the lymphatic leakage is extremely prompt. It is a very different situation anatomically from a small intrinsic malignancy located in the larynx. When it gets to the posterior wall in the larynx, it is truly hopeless of cure because of the lymphatic leakage.

I hope also for the discovery of some therapeutic or chemical cure. I question whether radium is going to accomplish very much in malignancy in this position. I have seen it used with remarkable results in sarcoma of the larynx, which nearly a year later developed an unquestioned squamous celled epithelioma on the site of the cured sarcoma. Was this a coincidence or due to the use of radium?

DR. JOHN M. INGERSOLL, Cleveland (in closing): I have found as yet nothing which offers as much hope of recovery as an early operation, if the condition can be gotten before it has extended beyond the trachea; in such instances it seems to me the hope of possible recovery is something like, but not as good as, in intrinsic malignancy of the larynx.

Studies Regarding Anaphylactic Reactions Occurring in Horse Asthma and Allied Conditions.

BY J. L. GOODALE, M. D.,

BOSTON.

Dr. Goodale reviewed briefly the literature relating to anaphylactic reactions following the administration of antitoxic sera, and reported a series of cases of vasomotor

disturbances of the upper air passages which were examined in regard to their reactions following the local application of horse serum to the abraded skin and the nasal mucous membrane.

SUMMARY OF CASES.

In five patients with horse asthma, the application of horse serum to an abrasion of the skin produced within a few minutes sharply localized edema and reddening. In three of these cases the introduction of horse serum in the nose caused edema of the nasal mucous membrane, together with profuse watery discharge and sneezing.

One case of horse fever without asthma gave a delayed reaction to the nasal test, but was negative for the skin test. A similar case gave a delayed but definite reaction to the skin test, but showed no nasal symptoms. Four of the horse fever cases without asthma were negative for both tests. In two cases, the sister who had horse asthma reacted markedly to both tests, while the brother, whose vasomotor symptoms from horses affected the nose alone, showed no reaction.

Six cases of bronchial asthma and five cases of hay fever were negative for both tests.

Three cases without vasomotor symptoms which had received immunizing doses of antitoxin several months previously showed no reaction to the tests.

The results of these experiments indicate that a localized anaphylactic reaction from horse serum may be occasioned in certain individuals who experience asthmatic disturbances from the neighborhood of horses. The severity of these vasomotor symptoms appears to be a determining factor in the production of the reaction, since persons with nasal symptoms alone do not appear to be sufficiently sensitized to horses to give a positive skin test.

The suggestion was made that a preliminary skin test with horse serum be made in all patients who have previously received an injection of antitoxin derived from horses, whether tetanus, diphtheria, or plague serum. Furthermore, in all patients who are about to receive antitoxin for the first time, inquiry should be made as to whether they have ever been disturbed by asthmatic symp-

toms when in the neighborhood of horses, and if so they should first be tested.

So far as these experiments go, they would indicate that in horse asthma a dangerous anaphylactic shock may occur after the hypodermic administration of horse serum. In horse fever with nasal symptoms alone, this danger is less or not at all to be feared, and in other types of asthma and of vasomotor rhinitis it is not present.

DISCUSSION.

DR. BURT R. SHURLY, Detroit: Dr. Vaughan has certainly elaborated one of the most scientific and most practical theories in regard to sensitization and anaphylaxis that has yet been brought before the scientific world, and the remarkable point of it all is that by injecting ordinary egg albumin solution in repeated doses the guinea pig dies in all the phases of severe surgical shock. And the point which was not brought out in the paper, is that it is exceedingly dangerous to inject any antitoxin after the ninth or tenth day from the initial dose. It was my pleasure many years ago to do the experimental work on the diphtheria antitoxins which were brought out by a large manufacturing house before they were put on the market, and we had occasion in a large diphtheria service for the first time to observe the very varying effects of antitoxin upon patients, and the very great difference in these effects according to the manufactured product. The product of some laboratories is exceedingly high in cutaneous reaction, erythema, urticaria, and these manifestations of anaphylaxis are decidedly at variance, according to the method of manufacture. So that of course the modern methods have greatly eliminated the dangers of sensitization where the reaction is decidedly less. Those of us who have met with an example of what it means to see a death in three to five minutes after the injection of antitoxin, certainly carry with us through life a most profound feeling of the very great danger which antitoxin may manifest, and yet in an enormous experience in our own city we have had but one fatal case after antitoxin administration. This was in a man of forty-five years, whom I was called upon to do a tracheotomy for, but who had the anaphylactic symptoms inside of three

minutes; in about five minutes he was dead. There was no history obtainable of a previous dose of antitoxin having been administered. But the very great danger comes in administering a dose after the ninth day; and it seems we have certain definite lessons to learn in the fact that we use horse serum to control hemorrhage, and we use the various kinds of antitoxin in our special line of work, and we should have these definite things well in mind. For some reason sensitization increases in a most marvelous way after the ninth or tenth day, and you will remember that the cutaneous eruption which occurs after antitoxin is almost always to be found on the ninth day. Therefore, whenever I give diphtheria antitoxin to anybody, I always tell them not to be afraid of developing scarlet fever or measles should this rash appear, as it probably will, on the ninth day. Another very definite thing which we should always have in mind before administering an antitoxin is to inquire if the patient is asthmatic or already using antitoxin.

Again, the use of the adrenalin glands are undoubtedly very greatly the source of many of these disturbances of sensitization, as shown by Sajous in his elaborate scientific investigations.

DR. HANAU W. LOEB, St. Louis: I should like to mention an experiment which I once saw which brought this matter of sensitization before my mind most convincingly. I could understand how if an animal was sensitized to any agent, being again injected he would die, but in Dunbar's laboratory he made another experiment which was far more convincing. The sensitized animal died in three or four minutes; then he took the urine of that animal and injected it into an unsensitized animal, and that one died in a shorter time, showing the production of a deadly poisonous substance produced in but a few minutes.

DR. J. PAYSON CLARK, Boston: I had the good fortune to run across what to me was a most marked case of horse asthma in a young man of nineteen years, who said that he had had asthma from the age of three to ten years, and was cured by going to the southern pines, and then by an osteopath. Also, when he was a child he could not eat eggs without a sense of constriction in throat and blotches

on his skin. For three or four years now, since he was fifteen years of age, he can eat eggs, but if he eats them raw he has a gagging sensation in his throat. As long as he can remember, he has been very sensitive to a horse or cat. Riding behind a horse brings on an asthma for which he has to go to bed—oppression in the chest, and all the symptoms of a severe asthmatic attack; at the same time he has sneezing and a watery discharge. The cat causes only nasal symptoms. On examination I found the septum deviated and the right and lower turbinates swollen; mucous membrane bathed in watery secretion. I thought I would try Dr. Goodale's skin reaction; I did not get it, whether due to my faulty technic or not, I do not know. Then I thought I would try by hypodermic doses of horse serum, beginning with a minute dose. I prepared a solution by mixing the horse serum with normal salt solution into which I put .05 per cent of phenol; on the first day I also applied some adrenalin to his nose to see what the reaction would be, and gave him a spray of camphor, menthol and albolene. On May 1st I gave him 1/1000 of 1 cc., with no reaction; on May 2nd, 1/1000 of 1 cc., with no reaction; I then intended to increase the dose to 1/10 of 1 cc., then to 1 cc., in successive days, until I obtained a reaction, but on May 4th he told me his mother did not wish him to have any more. He was perfectly willing. I then gave him one-fifth of one per cent solution to use in his nose as a spray. He had been completely incapacitated for work because any dust made him sneeze. His father telephoned to me the day before I left Boston to attend this meeting that his son did not sneeze at all any more and considered himself cured, and was going to take a position the following day.

DR. HENRY L. SWAIN, New Haven: I have seen one patient so near death this winter that I tremble to think how close to the brink he was. Now, if from such work as Dr. Goodale presents there is a method which we will be able to use as a test, we are certainly adding to the list of possibilities when the need of antitoxin comes up.

Is there any reaction in normal subjects?

DR. WILLIAM E. CASSELBERRY, Chicago: In Dr. Goodale's report he differentiates horse asthma from the general asthma class; the horse asthma patients will react to the

serum, and these patients are subject to immunization by means of the serum. We find many of our patients are a mixed form, suffering from horse asthma as well as other asthmas. In connection with Dr. Goodale's patient, who was an equestrienne and who reacted so favorably to the immunization with the horse serum, did she have asthma in other directions, and did this other asthma show equal immunization?

DR. GEORGE E. SHAMBAUGH, Chicago: I would call attention to anaphylactic reactions following the eating of certain fruits. I remember the case in my own family of an individual who had the phenomenon that her eyes would swell shut and the edema would extend to the conjunctiva and was associated with some sneezing. She at times had had slight asthma. We did not know what the condition was caused by, and yet I had seen several cases where edema of the larynx had followed the eating of grape fruit. When I noticed that, I observed in my own family that whenever grape fruit was eaten by this individual it would produce edema of the eyes, and so this fruit was cut out of her diet and the phenomenon disappeared; it has now been some time since she has had such an attack, and strange to say she can now eat grape fruit with impunity.

I saw a case in the last few years where the patient had frequent attacks during the winter of anaphylaxis, with very pronounced swelling of the eyes, puffiness of the face, coryza and discomfort. She lived quite a distance from me, and I never had a chance to see her during the attack, as she was very sensitive regarding her appearance. I examined her very carefully, and there was what seemed to me some evidence of hypertrophic ethmoiditis on one side; the symptoms were so annoying to her that I removed the anterior part of the middle turbinate to give her relief. The phenomenon continued at intervals; it apparently came on as a bacterial infection, and I was convinced later that it came from the tonsils, which I removed a year ago, and she has had no attack since. If I may judge from the results, the infection took place in the crypts of the tonsils, starting an anaphylactic reaction.

DR. JOSEPH L. GOODALE, Boston (in closing): There is no reaction in normal patients. There were three subjects

having antitoxin last October in a small epidemic, and the death of one of the boys brought this matter to my attention. The cases which had had previous antitoxin, especially cases of horse fevers, showed no reaction. In the first place, the one case of mild horse asthma with fever complained of a lot of sneezing and a little constriction, and developed the reaction forty-five minutes after the dose. So that we have very marked differences in the promptness with which these reactions appear. With regard to Dr. Shurly's statement, that the ninth day is the one when skin reactions are usually found, I find this varies markedly. The von Pirquet has shown this difference in rapidity of reactions after a full dose. They may appear in a few minutes, a few days, and the ninth day is usually the crisis at which the accomplishment of the storing of the zymogen reaches its maximum.

Replying to Dr. Casselberry's query, my first patient lives on a farm which she manages, and it is therefore a little difficult to separate the influence of horses from other influences. But I believe there are two types of asthma in this case, because I have on occasion made her leave the vicinity of the horses, during which times she was greatly improved; nevertheless, she still had some asthmatic symptoms. Since the removal of her tonsils four years ago she has been freer from continuous asthma, and the type is not simultaneous with increase in the edema of the ethmoid, but with the neighborhood of horses. It seems actually now as though she would have more comfort this summer than ever before.

Environmental Surgery of Otolaryngology.

By JOHN F. BARNHILL, M. D.,

INDIANAPOLIS.

In the early history of the practice of otolaryngology the field was a very limited one. The belief seems to have been that the nostrils constituted the nose, the tympanic cavity and eustachian tube the ear, and the structures outside the larynx were not included in the domain of laryngology.

As knowledge concerning the accessory sinuses of the

nose and ear, and of the lymphatic system, the cranial nerves and their ganglia accumulated, the field of work of the specialist of this class of necessity widened until at present any limitation which does not include the diseases of the entire head and neck would be unwise. That the entire field of the surgery of the head and neck lies within the domain of the otolaryngologic surgeon should now be conceded by all. It is not advocated, however, that all who limit their practice to diseases of the ear, nose and throat should undertake the many difficult and often capital operations necessary about the head and neck. Only a small percentage perhaps would feel sufficiently qualified to do so. It is advocated, therefore, that a cleavage in the ranks should take place, and that those who are nonsurgically inclined, and those whose surgical opportunities have been small, should limit their work to the therapeutic and local treatment of nasal and aural diseases, while those whose opportunities in surgery have been ample, and who are willing to devote their entire time to anatomic study and surgical progress, should undertake the difficult surgical problems of the upper air tract and its entire environment. Such an arrangement would be best for the patient, because it would save him from operation by those often little qualified to do surgery. It would insure better therapeutic measures on the part of those whose practice is not burdened by important surgical cases, it would free the real surgeon from the burdens of a large routine office grind, and would thus enable him to devote his entire time to the surgery of the most complicated region of the body.

DISCUSSION.

DR. D. BRYSON DELAVAN, New York City: This is a most burning subject, and has been one ever since the surgery of the larynx came into vogue. It bears out my own experience and that of all other laryngologists who have had to deal with operative laryngeal cases. The wife of a prominent officer, a splendid lady in early middle life, had a little papillomatous growth which Dr. Knight and I observed for two years, after which time she developed symptoms of malignancy, was operated on by a most expert operator, in one of the first hospitals in the city. No one could take the slightest exception to the operation, but

the surgeon left this patient in the hands of an inexperienced nurse, who had never seen such a case before, and the patient died. Another patient of mine had exactly the same experience, and so on through a long list of harrowing accidents of all kinds. The one man whom I have known in surgery who was willing to take a case and some advice with it was William T. Bull, whose cases of laryngectomy turned out better than those of anyone of his time. The suggestions in this paper meet with my approval, as I believe they are very valuable. There are two kinds of specialists as well as two kinds of surgeons. One kind is the therapist, whose strength lies in the medical side of laryngology, and the other kind is the natural born surgeon. It should not take long for one to discover on which side lies his forte.

DR. J. SOLIS-COHEN, Philadelphia: One case occurred in my own practice which I have never published, and one very similar to that mentioned by Dr. Delavan. As all the people connected with it are now dead, I will relate it. I performed a laryngectomy, leaving the wings of the thyroid cartilage, taking out simply the interior, by a method which I devised at that time. I performed the operation and I had, as I thought, a good assistant at the hospital. I lived only three or four squares from the hospital, and at twelve o'clock that night it seemed to me I must go to the hospital and see what was the matter with that patient. I went and found the male nurse asleep on the floor beside the patient; the resident physician had told me he would stay up with the patient all night himself, and would let me know if I were needed. Then I went into that resident's room and found him in his bed asleep. And if I had not been at that moment by his side, that patient would have suffocated from trouble with his tube.

Another case occurred somewhat like that, and I felt a desire to go to the hospital, and when I reached the bedside I found the man struggling with a trained nurse, who was trying to put in the tube upsidedown, strangling the man before my very eyes. Ever since then I have stayed by my patient for twenty-four hours. There are more patients lost by the after-treatment in laryngectomies than by the improper performance of the operation.

DR. HENRY L. SWAIN, New Haven: When we consider that

Gluck, who was the pioneer in doing complete laryngectomy, has performed his last sixty-one operations without a single operative death, it proves that the general surgeon, when he learns how, can do the work pretty well. When you take a man who does a thyrotomy and scoops out the growth without rhyme or reason, we understand why it is desirable for the laryngologist to be present. In other words, we who are interested and know the anatomy of the parts are better qualified to advise the general surgeon, and should at least be on hand to lend assistance and advice when such operations are being performed on our patients. This is equally true in removal of the hypophysis. If the surgeon wants to do the external surgery, all right, but we could do the operation as well or better.

DR. JOHN F. BARNHILL, Indianapolis (in closing): I agree with what has been said. I think, however, it was not understood that I feel, as do some others, that laryngologists and otologists should do neck and head surgery in general. How often it is that we remove a tonsil and we find that the child or adult has a large number of decaying lymphatics that must come out; it seems that we should be able to undertake this work and not have to call someone else to do it. I believe the patient would stand a better chance of good recovery, and we would have a better interest, and that by proper and sufficient training we should be prepared for this work even better than is the general surgeon of today.

Laryngocele Ventricularis.

By GEORGE E. SHAMBAUGH, M. D.,

CHICAGO.

This name was applied by Virchow to a condition which he had found postmortem, consisting of an elongation of the ventricle of Morgagni, extending as far as the upper border of the thyroid cartilage and occasionally to the hyoid bone. This condition is now believed to be a normal anatomic variation. The term laryngocele ventricularis, as here used, applies to a cystic dilatation of the ventricle of Morgagni, a pathologic condition which results from forcible distention with air of the ventricle, usually as the result of coughing spells or the use of wind instruments. It is

probable that as a predisposing factor an elongated appendix of the ventricle must be present. Cases occur where there is only an intralaryngeal distention, others with only an extralaryngeal distention, where the cyst has broken through the thyrohyoid membrane, producing a swelling in the neck, and other cases where there exists both an intra- and an extralaryngeal distention.

The case here reported occurred three years ago, in a woman, sixty-nine years of age, and developed in the course of a violent coughing spell. There was a distention in the neck the size of a hen's egg and an intralaryngeal swelling which filled at least two-thirds of the space in the larynx. About a year after the development of the laryngocele the condition became infected, and the most annoying symptom since then has been the discharge of quantities of foul smelling pus into the larynx; as much as a quarter of a tumblerful can be expelled at one time by pressure over the external swelling. The case has been greatly improved by an external operation, in which the cyst in the neck has been removed down to the opening of the thyrohyoid membrane. The intralaryngeal condition has been operated upon by slitting the cyst from below upwards with a hooked knife. There is still present an enlargement in the larynx which causes some annoyance, especially from the discharge.

DISCUSSION.

DR. E. FLETCHER INGALS, Chicago: I had a similar case without infection. I treated it by aspirating the cyst, and then injecting it with equal parts of 95 per cent carbolic acid and glycerin. At any rate, I got an excellent result at that time. But he came back to me within the past month, and the cyst is now altogether intralaryngeal, as large as a filbert, and I must do the same thing over again.

The Employment of Skiagraphy in the Diagnosis of Enlargement of the Thymus Gland.

By D. BRYSON DELAVAN, M. D.,

NEW YORK.

Enlargement of the thymus gland, whether associated with the conditions known as "status lymphaticus," or otherwise, can no longer be called a pathologic curiosity.

Cases occur with sufficient frequency to have brought the subject prominently forward, and a considerable literature upon it has been developed during the past ten years. Indeed, there are few clinics in which accidents due to this cause have not occurred to patients under operation. Diagnosis by ordinary means is often difficult, and the only intimation of trouble comes late.

Another difficulty lies in the infrequency with which illustrative cases present themselves. The average clinical attendant may never have seen one until he finds himself confronted with the fatal occasion.

Two cases are recorded in which the Roentgen rays were used, aiding materially in the diagnosis of the presence or absence of an enlarged thymus gland.

Routine examination of every case requiring operation would be very expensive and consume much time, and the reader suggested the possibility of reducing the cost and lessening the time consumed.

Since to examine all would be impractical, suspected cases only should have X-ray examination before operation is attempted. Careful instruction should be given and clinical assistants warned as to the dangers of operating on patients with enlarged thymus gland, that they may be made competent to diagnose such cases when they present themselves.

DISCUSSION.

DR. CORNELIUS G. COAKLEY, New York City: I recently had an experience in an adult. A man was sent to me for an opinion as to what should be done for what seemed, from the history before seeing him, to be goiter. The man had an enormous neck. The entire obliteration of the angle of the jaw was present, so that from the neck to the jaw was a straight line. There was slight exophthalmos. The pulse rate was 130 when quiet, and feeling that in all probability it was a case of exophthalmic goiter, I referred him to Dr. John Rogers. Radiography showed a tumor behind the sternum, a good sized mass, with every suspicion that it was an enlarged thymus instead of a thyroid. After observing him for a week or ten days, Dr. Rogers thought the enlargement, which varied from time to time, was due to some lymphatic obstruction connected with the

thymus gland, and suggested that he make an exploratory incision of the thymus behind the sternum, and if feasible to explore the enlarged growth to do so, and if a malignant process were found to leave it alone. He made his incision in the skin, and found that, instead of small peripheral veins, the superficial veins were as big as his little finger, perfectly enormous. He got his finger down and found an enlarged thymus gland, but thoroughly and extensively bound down to all the tissues in the thorax, with no possibility of removal without the death of the patient. He was sewn up and lived for only a few months. It is the only case of unquestioned malignant disease of the thymus in an adult that I have ever seen, and it was diagnosed pretty satisfactorily by radiograph.

DR. JOHN F. BARNHILL, Indianapolis: The radiograph looks very much like a number of radiographs I have seen of the thyroid in the substernal variety, and of course that would hardly be the case in a child so young, but it might have been the case with Dr. Coakley's patient. It must be very trying in such a case to be sure of the diagnosis. Dr. Wilson, of the Mayo clinic, has a large number of cases which closely resemble the one reported by Dr. Coakley.

DR. BURT R. SHURLY, Detroit: This question of enlarged thymus is exceedingly interesting. These cases afford us practical interest when we know that tonsils and adenoids are quite frequently associated with these attending conditions of hypertrophy of the thyroid and thymus, and it is particularly interesting from the standpoint of the inter-relationship which the tonsils and adenoids and thyroid have to each other. The enormous percentage is what I want to call attention to in a large autopsy report, showing that we undoubtedly operate on thousands of cases of enlarged thymus without knowing it, and it is only the very unusual case that dies suddenly that comes under our immediate observation. I happened to see a post-mortem at the Massachusetts General Hospital that showed what an alarming condition can be present in the way of an enlarged thymus, without anybody knowing anything about it. There are but few diagnostic methods from the physical signs to make one even suspect it. This case had all the clinical symptoms of status lymphaticus,

and the boy had died from an incised wound of the knee under ether with just a few stitches being necessary. This brings vividly to mind in what great danger we are continually in operating on adenoids and tonsils without knowing our danger.

DR. THOMAS HUBBARD, Toledo: Thymic asthma is a condition related to something like status lymphaticus, and pediatricists are working along a line similar to that suggested by Dr. Delavan for treatment by the X-ray; this is marvelously effective. Two cases have come under my notice, though neither was my case. One child was sent for an adenoid operation, the child under one year of age. The difficulty in breathing impressed the physician, and he called in a pediatricist, who suspected thymic asthma, and the X-ray showed a merging of the thymus and heart shadows, and following the line of treatment which is now undertaken with the X-ray, after seven treatments there was produced almost immediate and permanent atrophy of the gland.

May this shrinkage not go on to an undesirable degree?

Another case of similar type is one in which almost magical shrinkage of the thymus was produced in about the same aged patient. Both children seemed to have but a short time to live, both were extreme cases. The interesting feature is that the X-ray is not only a diagnostic factor, but also a positive therapeutic cure in the very young cases which we occasionally see, owing to the obstructive type of respiration which is sometimes mistaken for adenoid obstruction.

DR. HENRY L. SWAIN, New Haven: I have twice had cases of thymic asthma, and diagnosed the condition with X-ray pictures, showing we were right, and then have secured marked benefit and a cure by the simple use of adrenalin ointment. The two glands, the suprarenal and the thymus, are antagonistic in action, and it did work very well, rubbing adrenalin ointment in over the top of the gland three or four times a day, and we got an appreciable diminution in size and the restoration of perfect breathing.

DR. B. ALEXANDER RANDALL, Philadelphia: I would like to call attention to a case in which, after excision of the tonsil, I lost the patient, twenty-two years of age. It

seems to me that much of the foregoing discussion points to the occurrence in rather early life, and we need perhaps to emphasize this possibility of a later exposition of it. This young man had two or three tonsil operations under ether, and had come through them successfully. Every care was given to him. There was no suggestion to my mind of thymic asthma, and his family physician had not found any evidence, and the amount of thymus enlargement found after death was not enough to give any mechanical explanation to the fatal issue, and yet he died twenty hours after the operation.

Nasopharyngeal Myxosarcoma—Several Operations and Finally Spontaneous Recovery, Under Observation for Twenty-seven Years.

BY E. FLETCHER INGALS, M. D.,

CHICAGO.

A boy of thirteen years was first seen by the writer in 1883. He had a large tumor filling the nasopharynx and right nares, obstructing both sides by its pressure. It proved to be a myxosarcoma; most of it was removed. A small part grew back of the pterygoid process and appeared under the zygomatic arch in right cheek. Operation was attempted through the angle of the mouth, but severe hemorrhage compelled the closure of the wound without effecting this purpose.

After all the tumor had been removed anteriorly there still remained a large mass in the posterior nares attached to the roof. There was no way in which a wire could be placed around this. The writer forcibly introduced brass tubing containing a sharpened piece of copper wire. Several brass tubes were thus introduced and through these wires were introduced encircling the growth in the different loops. The tumor thus was completely severed and withdrawn through the mouth. The patient became unruly and was sent home.

The tumor continued to grow, causing great deformity of the right cheek, and destroyed the vision in the right eye. Three or four years later it began to atrophy, and when he appeared fourteen years afterward, and again after his first visit, there were no remnants of the tumor,

although the deformity of the cheek, the enormous cavity of the nose and the absence of vision from the right eye continued. Although this growth was of a semimalignant character, it followed the well known tendency exhibited by fibrous growths in this locality, of retrogression and final disappearance between the nineteenth and twenty-third year of the patient's age.

DISCUSSION.

DR. HARMON SMITH, New York City: I wish to relate briefly a case reported recently of lymphosarcoma. I do not know whether the difference in pathology would alter the result with myxosarcoma. This case was sent to me by the General Memorial Hospital, to relieve the man so that he could breathe and swallow. The growth involved the right tonsil, pharyngeal wall, and palate, so that he could not breathe except in gasps, was cyanotic and greatly emaciated. I operated, doing a preliminary tracheotomy, believing I would have hemorrhage; I took away half the tonsil and lateral pharyngeal wall, but had no hemorrhage; then I packed, but still no hemorrhage. On the second day I removed the tracheotomy tube. This was done a year ago, and the patient returned again last January to the clinic, when there seemed to be involvement on the left side, and it was found by examination to be lymphosarcoma. He disappeared again for a month or so, then came back with extensive involvement of the left side. I took out the left tonsil, left pharyngeal wall, and the remainder of the palate. He seems now to have completely recovered. The only complicating feature of the case is that he had been subject to epileptic attacks, and when these tumors began to grow the fits increased in number; following operation they subsided for a month or so.

The Simulation of Paranasal Sinus Suppurations for Teaching Purposes.

By GREENFIELD SLUDER, M. D.,

ST. LOUIS.

The accessory sinuses of the nose having been opened by dissection from its cranial aspect in a section of the skull previously decalcified or hardened in formaldehyd

and stained in an ammoniacal solution of carmin, is then preserved in a 2 per cent solution of benzoate of soda. The latter prevents decomposition and also hinders corrosive effect on the hands. To simulate pus a preparation of subcarbonate or hydroxid of bismuth held in suspension in an hexatomic alcohol (mannite) and stained with anilin yellow and methylene blue is required.

A drop of this preparation is introduced into the opened sinus, and the examination is now made with a speculum introduced into the nose by means of a reflected light.

The simulation of the clinical picture thus produced is so true to life as to be astounding, and all the subtle variations may be reproduced by the quantity of the mixture or its dilution.

The Correlated Action of the Pharynx and Soft Palate, and Its Effects Upon Postnasal Diagnosis.

By GREENFIELD SLUDER, M. D.,

ST. LOUIS.

The resultant action or effect of the pharynx and soft palate acting at once in the functions of empty swallowing and gagging is here considered.

There is a gentle degree of muscular contraction in the ordinary act of swallowing, while in gagging the vermicular action is from below upward with the strongest contraction.

The anatomic conditions with careful measurements are described and the dimensions given.

A pigment of a mixture of bismuth subcarbonate and hydroxid is introduced through one nostril by means of a small cannula and syringe to arrive at the upper surface of the soft palate at a point in the center line of the choanal outlet.

In a normal adult pharynx, upon swallowing it is found to be spread over its posterior wall as high as the lower margin of the eustachian tube on both sides.

This, however, is by no means constant, and there is a varying degree of obliteration that may take place in swallowing or gagging.

The degree of elasticity in the soft parts is practically

constant, and hence it is possible that obliteration may occur by the easy play of the muscles..

The greatest value of these studies is to know that by the ability of the small pharynx to approximate its walls it possesses the power to wipe away small amounts of thin secretion from any point of the choanal plane.

The practical application of these observations is that it illustrates the difficulty of locating discharge from the accessory sinuses into the posterior nares if the patient gags much.

Alterations in the form and size of the pharynx make the various deceptions possible. It is of course self-evident that pus at the classical sites well forward of the choanal plane, with or without a clean pharynx, is of conclusive diagnostic value, and is uninfluenced by any of the above enumerated possibilities.

It is distinctly helpful to know to what extent a given nasopharynx is obliterated in swallowing or gagging.

DISCUSSION.

DR. CORNELIUS G. COAKLEY, New York City: We have had now an actual demonstration and exhibition of the appearance of sinusitis in the field of the nasal pharynx which have not arisen there but have come from the nasal accessory sinuses. I think this is one of the most valuable contributions to the aid in diagnosis of sinus disease we have had in a long while.

DR. B. ALEXANDER RANDALL, Philadelphia: In speaking some years ago about the rather overlooked action of the upper edge of the superior constrictor which forms the so-called cushion, I dwelt a little bit upon some of these points, and I think we have to thank Dr. Sluder for having made the possibilities in that matter more interesting and clear. And I think we should bear in mind in this matter the extreme shelf-like character of that upper edge of the muscle, and take note how the soft palate will go entirely above that and show a deep cavity underlying the palate and modify this shelf-life effect, and this will go to show why from below in many cases the palate can reach clear to the vault.

DR. JOHN F. BARNHILL, Indianapolis: This has been a

very practical sort of paper. For a long time I have doubted any such thing as Thornwaldt's disease, namely, that pus formed in this normal pocket because of adhesions closing its mouth. I have yet ever to see such a thing, and I have for a long time regarded pus in this region as absolute evidence of either postethmoidal or sphenoidal disease.

Limitations of Bronchoscopy.

By CHEVALIER JACKSON, M. D.,

PITTSBURGH.

After a long series of successful bronchoscopic foreign body removals one is apt to think there are no limitations to bronchoscopy. The author had had five failures, one of which he excluded because he alone had bronchoscoped the case and permission for a second bronchoscopy had been refused. The other four cases had been attempted by two or more other bronchoscopists, and therefore might be said to define the limits of bronchoscopy. The limitations of bronchoscopy were reached in the inability to find a small foreign body far down and far out at the periphery of the lung, rather than in a failure to remove when found. The limitations in a particular case could not be said to have been reached until bronchoscopy had failed at the hands of at least two bronchoscopists of experience. Then thoracotomy should be done immediately, without waiting for pus formation. In his own cases the author would not feel justified in advising thoracotomy until another bronchoscopist besides himself had failed. Waiting for a foreign body to be coughed up was inadvisable, because, as shown by Delavan, even after expulsion, death had followed from disease meanwhile set up.

DISCUSSION.

DR. CORNELIUS G. COAKLEY, New York City: With regard to the case of 1908, referred to, this woman had held a pin in her mouth; it was one with a white bead head and was about an inch long. She also had a very large goiter which had compressed and dislocated the trachea so that it was practically impossible to pass a bronchoscope down to the

trachea. We could not use force enough to pass it below the compressed area of the trachea as far down as the bifurcation. A tracheotomy was done and then a subsequent attempt was made to get the pin; the patient coughed and I lost the pin, which went down further with the point up, and although I was able to see it I was later unable to get it. Dr. Jackson did not even see the pin. I think there is no question that had the modern methods of lung surgery with the intratracheal anesthesia been then developed, it would have been a perfectly safe and probably successful procedure in removing this pin. This attempt took place in about the first three weeks of the involvement. Dr. Jackson, in his modesty, did not tell you of another case. Dr. Jackson very kindly came to Rochester about two years ago to see my sister-in-law, who had inhaled a piece of orange peel through the larynx into the trachea, and developed soon after a very severe irritating cough and bronchitis, forgetting all about the original cause until about two weeks after the accident, when the physician discovered this localized bronchitis and could not understand why it was localized until he got this history. Moreover, the fact that on two or three previous occasions some similar foreign body had been taken in during the process of mastication, coughing and inhaling, and each foreign body had been expelled within a few hours or two or three days after the accident. A radiograph showed considerable involvement of that side of the lung, but air could get in. After a physical examination Dr. Jackson decided, although there was nothing showing in the radiograph, not to do a bronchoscopy. The patient developed an abscess there and a bronchiectatic abscess or abscess of the lung, and discharged pus in great quantities and lost fifty or more pounds in weight during the next six months. The sputum showed no evidence of tuberculosis. She made a good recovery after a year of suppurating process in the bronchus or lung about this bit of white skin from inside the peel of the orange. If Dr. Jackson had gone down and done a bronchoscopy, in all probability with his skill he would have found that piece of skin and removed it and saved the patient the following dangerous, but fortunately not fatal, condition.

DR. THOMAS HUBBARD, Toledo: With regard to the limitation of bronchoscopy, this may often be established by the patient. Nothing is so exasperating as not to have your patient's support and that of his physician. Dr. Jackson will corroborate me in saying that secondary operations are very difficult ones without the full support of the patient and attending physician. On the other hand, occasionally the support of the patient is a factor in success. I recall a case of a woman who had a fragment of dental cement in the lower right bronchus, and one of these radiograms reminds me of it; it was located about the ninth rib posteriorly, with some months of ulceration, abscess formation, and all symptoms of tuberculosis. This woman's intuitive conviction that she had a foreign body there saved her life. Although two or three radiographs showed nothing, she insisted there was something there, and finally a competent roentgenologist located it. The first attempt at removal was a failure; the abscess cavity was full of pus and débris, and I could not locate the foreign body; the second attempt was made with a stereoscopic picture to guide us, and we successfully removed the foreign body and the patient recovered. Following the first operation I told her we had failed, but she said, "Never mind, you will get it the next time." That courage inspired us to do our best, and we were successful.

I recently had another patient with an upholsterer's tack in the right lung, who had been worked upon four hours consecutively by a bronchoscopist under local anesthesia. He had literally soaked the patient with cocain and his courage never faltered. After four hours' trial he consented to another type of operation. This I deemed impracticable by the upper method, fearing laryngeal edema after such a prolonged use of the tube. So a low bronchoscopy was done and the foreign body was found. The previous efforts had turned it sideways and made it very difficult to extract. I must say that I doubt if the upper method could have reached the point of that nail, because it was so far to the right, and it was necessary in the introduction of the tube through the lower wound to carry it off at an extreme angle to bring the tack into the tube.

DR. EMIL MAYER, New York City: I recall being asked

to see a boy who had a tack in his right bronchus, which had been there for more than a year, in the Presbyterian Hospital in New York. It was quite easy to do the bronchoscopy, but I simply could not see any sign of this tack. The bleeding was profuse and put me in such position that I could not see any evidence of the foreign body, and I felt that here was one of the important rules to live by—"be sure you are right, then go ahead." It is possible if then I had known as much about using the powerful magnet as Dr. Iglauer has recently recorded, I might have been more successful.

In another instance, showing the difficulties of bronchoscopy, I was called recently to see a young infant of about thirteen months, who had inhaled an open safety pin. A picture showed the pin in the upper portion of the larynx, and the local physician thought he could get it out by doing a tracheotomy. He failed. A second picture showed the pin had slipped down into the bronchus. It was not a difficult thing to introduce the bronchoscopic tube through the opening the physician had made, but the baby's condition was poor and I could not find the pin; the child's condition becoming worse, I desisted, and a few hours later the child died.

DR. D. BRYSON DELAVAN, New York City: It is interesting to understand the limitations of bronchoscopy, but also to thoroughly realize what it has done for humanity, and we all recognize that it is purely an American invention. Dr. Horace Green was the first to promulgate this method of treatment. Before the days of bronchoscopy the inhalation of foreign bodies was necessarily fatal. I remember a case in the '80's at the New York Hospital, where a young trained nurse with pleurisy was placed in my hands and we aspirated the chest. When introducing the cannula, and just as we had it well in position and were about to withdraw the blade, the girl made a wild movement of the arm, drawing it sharply back so as to break the needle close to the body, and by the time we raised her arm the needle had disappeared. We said nothing about it; there was a rise of temperature, but the patient got well. I followed her about twenty years, during which time she carried on her function as a nurse in excellent health.

Another case was a young farmer, who inhaled a full head of barley. The accident was followed by violent pneumonia and that by abscess of the lung, which broke through the outer wall of the chest, and in coming away the head of barley was found intact. He survived all of this. Such results are extremely rare.

DR. E. FLETCHER INGALS, Chicago: I am very glad that Dr. Jackson has brought up this subject, and I hope he will in closing say something about the limitations as to time. Dr. Hubbard spoke of some one working for four hours, and this impresses upon me the necessity of having a final word on the time one may work on such a case. For my own part, I have felt that we ought not to work more than half an hour. When one feels the next second will be successful, he hates to quit; also when there is a good deal of secretion, you dislike to stop before you try once more. In some of these long drawn out operations, about nine-tenths of the time is occupied in swabbing and one-tenth in looked for the foreign body. If we say no case should be operated on for longer than one hour, we would not be far wrong; while half an hour is the limit in the majority of cases.

I have had my failures in getting out foreign bodies, and I have sweat blood over them. I have recently, as you know, written a short article on fluoroscopic bronchoscopy, which I think is going to be a great aid in certain cases. With foreign bodies which do not throw a shadow, we must still rely on ordinary bronchoscopy. When there is an abscess formation with much pus, it is often impossible to find the foreign body. When there is a stricture it is liable to be impossible. Fortunately, some of these organic substances will be coughed out, but I think that 90 to 95 per cent of people will die from foreign bodies in three or four years from various abscesses, usually multiple, unless the foreign body is removed.

DR. WILLIAM E. CASSELBERRY, Chicago: These bodies do not always stay put in the lungs; they are movable, some of them, and it may explain why some of them, such as collar buttons, etc., have not been found on bronchoscopic examination. This was illustrated in my practice by a large grain of raw corn, first in the bronchus of a very small child; the child was small, and I should perhaps have made

a lower bronchoscopy, but I made an upper bronchoscopy, and although there was considerable difficulty in getting this tube through and in getting vision, it did go to where the skiagraph showed a spot which seemed to be the grain of corn, and this showed in four skiagraphs. It corresponded to a place where there was obstruction and density of air. I aimed for that spot with my very small bronchoscopic tube, and searched diligently, but found no grain of corn. Things were beginning to look very uncertain when on withdrawal of the tube, gradually and cautiously, just as my tube slipped out of the top of the larynx, the grain of corn popped into view beneath one vocal cord. In that position of the patient, with the head down, it had left its position in the bronchus and slipped up.

DR. HARRIS P. MOSHER, Boston: I have put the limitations upon myself rather than upon the subject. Certainly, in the case where I hunted two hours the other day to find a foreign body, I felt the limitations were mine.

In one case, after the patient came out of ether, there was a right hemiplegia, but that was the first time it had ever occurred in any case I have had to do with. The question came up as to what was the cause, whether it was the heart condition, the strain of the cyanosis in a thick necked individual, or an embolus.

There is another thing in connection with bronchoscopy. I have not seen it mentioned in the books, but it has occurred to me three times successively. This is a procedure that I do not feel like bringing before you, as it seems like going back to working in the dark. That is the old procedure of fishing. As you know, in many cases when you get the open speculum in, which was used before Dr. Jackson's speculum was devised, the cords stand very clearly apart and you look well down into the trachea. The trachea, however, is not likely to open. It occurred to me in such cases you might use the trachea for the tube in place of the bronchoscopic tube, in other words, having the cords well open, you could go down with your forceps and take a blind shot in the dark, knowing it was a blind shot. The first case of mine was in a two-year-old girl, who had a two-inch pin lying head up and across. In that case a blind shot, boxing the compass with my forceps, was successful. The second case was a fifteen-months-old baby,

who had a nail in the lower bronchus, head up, and in that case I decided to try a shot before putting the case under ether. I caught the head of the nail and brought it out. I just have had a third case in connection with Dr. Clark, in which a fifteen-months-old baby had a peanut in the bronchus for three or four days; the trial of a luck shot here did not reveal anything. A luck shot in the right bronchus produced nothing, but in the left bronchus it brought out the peanut. If you will gauge the limitations and put a limit on yourself, it is worth while to try this shot in the dark, because it will sometimes work.

DR. CHEVALIER JACKSON, Pittsburgh (in closing): In regard to Dr. Mosher's statement as to the limits, the point I want to make is that the difference between personal limitations and the limitations of the method are shown when two men have tried and failed, for then I think we can call that failure due to the limitations of the method rather than to personal limitations.

In regard to the case of embolus that occurred after a foreign body which was quite easily removed four weeks previously with no special difficulty. Either from a septic endocarditis or from the lung itself an embolus had gotten into the cerebral circulation. His physician reported the boy improved for almost a month and gaining rapidly, when suddenly he had a convulsion with paralytic symptoms.

Dr. Swain raises a number of interesting questions in regard to anesthesia, but I have seen no reason to change my attitude in this regard from that of two years ago, especially in children under six years of age.

In regard to suspension laryngoscopy for foreign bodies, I have not tried it, and therefore am not qualified to speak; I have no doubt it has a large field of usefulness.

The limitations in regard to time were asked for by Dr. Ingals. Each must decide for himself. The limitations stated by Dr. Ingals are about right. If every man would publish the time used on every case it would be well. Half an hour for a child and an hour for an adult might be taken for a standard, to be modified in the particular case. My own personal limits have been in adults three and a half hours, but this patient had no anesthetic, he was a marathon racer, an athlete used to enduring physical stress, and he insisted on my going ahead.

Dr. Ingals brought up the limitations in upper lobe bronchoscopy, which I am glad he called attention to. The limitations I spoke of were far out in the periphery in the posterior branch, too small for bronchoscopy. All were failures to find, not to remove foreign bodies after finding them.

Dr. Delavan referred to Horace Green's work; this is entirely new to me.

Dr. Mayer's and Dr. Hubbard's points bring up too much for this discussion. In regard to Dr. Coakley's case, where we decided not to do the bronchoscopy, that was an error of judgment on my part, and is not to be taken into consideration in this discussion, because if we include the errors of judgment there is no limitation to what bronchoscopists may do.

SYMPOSIUM.

EMPHYEMA OF THE NASAL ACCESSORY SINUSES IN CHILDREN UNDER FOURTEEN YEARS OF AGE.

The General Considerations of Empyema of the Nasal Accessory Sinuses in Children Under Fourteen Years of Age.

BY LEWIS A. COFFIN, M. D.,

NEW YORK.

It is indeed remarkable that although case after case of affection of the accessory sinuses in children has been recorded by rhinologists, no mention whatever is made thereof in the textbooks devoted to pediatrics. As a consequence, many cases that have advanced to the suppurative stage might have been prevented and saved much suffering had an early diagnosis been made and proper treatment instituted. In acute conditions, if a sinusitis is suspected, there is a copious discharge which may be washed out or otherwise cleared of secretion; if then negative pressure is applied to the nostrils and more pus or mucus found, we may be quite sure that it comes from some of the accessory sinuses.

Children subjected to the test showed streptococci, staphylococci and pneumococci.

The safest form of treatment is in the use of the postnasal douche.

* The writer has found great satisfaction in treatment by negative pressure (suction) and the use of autogenous vaccines.

The Pathology of Acute Sinusitis of Children Under Fourteen Years of Age.

BY GEORGE B. WOOD, M. D.,

PHILADELPHIA.

The pathology of acute sinusitis is influenced by the severity of the infection and by the resistance of the patient, and upon these two factors depend the degree of inflammation. The characteristic changes found in the mucosa in the mild cases are: congestion and slight edema of the connective tissue, increase in the number of beaker cells in the epithelium, and slight increase in the number of lymph cells in the superficial layers of the connective tissue. In the more severe cases the edema is increased, the congestion more severe and the extravasation of the red blood cells into the connective tissue stroma becomes so intense that the condition resembles a subepithelial hemorrhage. The leucocytic infiltration is marked but still only involves the subepithelial layers of the connective tissue. In only the very severe cases does the whole connective tissue layer become infiltrated so that the periosteum is attacked. Infiltration of the periosteum is very apt to be followed by bone changes. In diphtheria sinus involvement is very frequent, though the majority belong to the mild catarrhal group. In scarlet fever sinusitis is less frequent but more severe, so that bone involvement is quite common. Other infectious diseases show nothing peculiar or characteristic.

The Surgical Treatment of Empyema of the Nasal Accessory Sinuses in Children Under Fourteen Years of Age.

BY C. G. COAKLEY, M. D.,

NEW YORK.

The writer is convinced that inflammation of the nasal accessory sinuses occurs as frequently in children as it does in adults.

As the sinuses are undeveloped, there is a greater tendency to spontaneous cure.

General anesthesia is necessary for examination, if under five years of age; transillumination is valueless under ten years of age.

In mild cases suction may be used to advantage.

Cases requiring surgical treatment have either a swelling over the antrum or around the orbit.

The antral cases are most always associated with an osteomyelitis of the superior maxilla and are operated through the canine fossa with a counter opening in the nose.

The orbital cases, if mild, are kept in bed with cold compresses and frequent instillation of a 1 per cent solution of cocain and a 1/20,000 solution of adrenalin. The severer type requires operation without waiting for the development of a radiograph, and is an ethmoid and sphenoid exenteration through the external route.

A probe is passed into the frontal sinus and the diseased membrane must be removed lest there be recurrence; the wound should be left open. There is no consequent deformity.

DISCUSSION.

DR. HARRIS P. MOSHER, Boston: It is hard to get data on the development and the size of the accessory sinuses in children. Very few bodies of children find their way into the dissecting room, and children make poor subjects for X-rays. Occasionally, however, we do get an X-ray, or have a chance to investigate the sinuses at autopsy. In such instances I have usually been surprised at finding the sinuses larger than I anticipated. This is especially true of the sphenoidal sinus. In one case, a boy of twelve years, the sphenoid was of average adult dimensions. Most of us, therefore, have to go for our information to the men who have been fortunate enough to have material for making observations upon the sinuses in children. Onodi, who has published a book on the "Accessory Sinuses in Children," is our chief authority. I have roughly traced some of his plates and grouped and charted his findings. They help to visualize his results. Also, I examined ten X-rays taken of children's heads, in cases where there was a question of fracture of the skull. These rough tracings are also submitted.

According to Onodi, less is accurately known about the

maxillary sinus than about the others. Investigation seems to have been focused upon the frontal sinus and the ethmoid cells. The antrum appears in the fourth month of fetal life, and at birth is a cul-de-sac about the size and shape of half of a coffee bean. Tooth buds take possession of the body of the superior maxilla and give the antrum but little room until the second dentition. At this time the antrum enlarges quickly. Another important observation in connection with the antrum in young children is that it is best approached from the nose through the middle meatus. There is but little space under the inferior turbinate, and the wall of the antrum there is much thicker than in adult life.

The ethmoid cells are present at birth, two or three posterior cells, and a like number of anterior cells. The posterior are the larger; a distinction which they retain throughout life. The ethmoid cells increase rapidly in size, relatively much faster than the frontal sinus or the sphenoid. At the thirteenth year the ethmoidal labyrinth is of adult width, and the cells nearly, if not actually, of adult size. An X-ray taken at this period is striking, because the ethmoid labyrinth is wide and apparently fully developed, whereas the frontal sinuses (in comparison) are small.

There is no frontal sinus at birth; only a comma-like fossa at the summit of the unciform groove, which by upward growth is to make the sinus. By the third year the frontal sinus is peeping above the level of the cribriform plate; the sixth year the height and width may measure 10 and 10 mm. The frontals grow very unequally. Onodi figures one case of an eight-and-a-half-year-old child in which an adult sinus was present. From ten to fourteen years it is common to find what might be classed as a small adult sinus. I have tracings of a sinus at ten years, and of one at fourteen years, which illustrate this.

The last accessory sinus is the sphenoid. At birth this sphenoidal sinus has a well formed ostium and a small cavity. By comparison the frontal sinus at this time is far behind the sphenoidal in development.

The order in which the sinuses enlarge seems to be roughly as follows: From birth to the third year the

ethmoidal cells have the lead; then the sphenoid starts to enlarge actively; at the sixth year, or the period of second dentition, the antrum becomes active, takes the lead, and ever afterward holds it. From the sixth year also the frontal sinus, the laggard of the sinuses, increases rapidly.

The gist of the matter is, that from the third year there is an antrum large enough to permit of surgical treatment. The same is true of the ethmoid labyrinth from six years onward, and of the frontal from the eighth year. From the third year a surgical sphenoid may be expected. Precocious development of the sinuses, and there are numerous cases reported of surgical interference which show this, may make any or all of the sinuses of surgical size before the periods just mentioned.

DR. THOMAS HUBBARD, Toledo: I would like to speak of three or four types of cases which have come under my observation, of acute sinusitis in children. First, a young child of six years of age with orbital abscess following measles; this case was seen some time after the initial attack, and there was a sinus which had ruptured through the orbit, and although the child was in good general condition, the parents refused operative interference, yet nevertheless the child recovered. The second is one of the fulminating types of scarlet fever in a girl exposed to the cold after the initial symptoms of fever, and she very suddenly developed acute general sinusitis, and inside of forty-eight hours there was coma, and death inside of three days. That was one of the cases which are absolutely inoperable. The third type is of scarlet fever of less malignant character, but the initial symptoms were otitis media; very prompt paracentesis; the next day symptoms of marked pharyngitis, and following that the rash and typical symptoms of scarlet fever. Although this child was in the best of hygienic surroundings, with the best of nursing, the ear went on to a suppurative mastoiditis, and a mastoid operation was necessitated about the third week. General sinusitis on both sides was developing with gradually increasing severity; the symptoms were typical and worse on the side of the involved ear. This boy was at that time seven years of age, and the right sinus seemed to reach the maximum of inflammatory disturbance, then

gradually subsided. This gave me hopes that the left side would follow suit, but the general systemic disturbance necessitated a general operation upon the left sinus about three weeks after the mastoid operation. A complete radical operation was done, modified. The frontal sinus was involved only in its lower portion, and consequently there was no opening above the orbital ridge. Complete ethmoid exenteration. Probably the sphenoidal sinus was also opened, as was the maxillary antrum, which was thoroughly cleaned out. Three or four days of marked improvement followed, then a relapse with a gradual rise of temperature. Autogenous vaccine made from the granulations taken from the ethmoidal cells was given, with exacerbation of temperature for about forty-eight hours, then marked improvement and complete recovery. The patient was under observation for five years with several severe attacks of rhinitis, but only last winter did he again develop any symptom of pus in any of the sinuses, and here it was necessary to wash out the antrum for a few days, and it then subsided.

Another case is of the subacute chronic type, in a child of six years, brought up on the floor of a basement; he had a succession of acute attacks of coryza, finally resulting in a general suppurative sinusitis involving all the cells on both sides. This boy was treated according to the method suggested by Dr. Coffin. It was impossible to irrigate the antrum more than about six times, for after that it produced such a nervous shock that it had to be discontinued. Negative pressure was undertaken every day, about three pounds, to withdraw the pus which was considerable, and after each treatment he would be very comfortable for some hours. There was more or less purulent bronchitis in this boy. We were finally driven to operate, but his condition was so critical that I limited it to an opening from the maxillary antra into the nose. Within twelve hours after operation his temperature was 103.5 degrees, and he developed a bronchopneumonia, and I am thoroughly convinced that a prolonged operation would have resulted in death. The antra have since remained comparatively clear, there now being natural drainage, yet eventually, as soon as his condition warrants it, it will be necessary to perform a complete exenteration of the ethmoids.

DR. EMIL MAYER, New York City: There seems to be another class of cases of this affection in children between the two types as mentioned by Dr. Coakley, of moderate inflammation and infiltration of the orbit, and of the severest type, and I have recorded such an instance and found to my surprise that all the other cases of a similar kind recovering had the same train of symptoms. All the patients were in the neighborhood of from three to five years of age, and all had the following conditions: an opening or perforation directly under the eye about half an inch, an ectropion, and foul smelling discharge. A probe dropped into the opening over the zygoma went into a cavity and turned toward the nose and was easily pushed into the nose. In my own case an external operation, consisting of linear excision, curetting and drainage through the nose, was followed by complete cure.

DR. WILLIAM E. CASSELBERRY, Chicago: I wish to speak of a chronic type of case, particularly of a conservative operation that I have before spoken of, which, although these cases are in children, they are in the older children, and which I have found feasible in them. They affect children anywhere from nine to fourteen years of age. It is the kind of case you see frequently even in older people—nasal polypi in the middle meatus, polypoid enlargement of the middle turbinate, and pus in the antrum and anterior ethmoidal cells, and sometimes in the posterior ethmoidal cells. These polypi, if removed one week, will be there again the next week, developing with extreme rapidity. If removed, however, together with the better part of the middle turbinate, and at the same time you go a little higher and take the floor of the anterior ethmoidal cells, they do not return within the month, as before. This operation I have found feasible in a limited number of cases under cocain anesthesia. Occasionally I have had to give a general anesthetic. I recall one which resulted in such an amount of recovery that it has required no further operative procedures. The subject was impressed upon me by a child upon whom I did not succeed in making such an operation, and in whom I should have urged either an external or an internal operation under a general anesthetic. She was a beautiful girl, a blonde, in whom to propose

any external procedure to the parents would have seemed like a sacrilege. I removed, in the fighting child, polyps from time to time as best I could without middle turbinectomy. I cleansed the nose and washed the antrum. The thing went along for three or four years, when, as she was traveling on the Rhine, she became suddenly seized with a severe headache, was taken off the boat to a hotel, and put under the care of an English surgeon, who said she had meningitis, and she died within a few days. There is always this menace, even in children, and I believe it our duty to establish drainage. I do not believe it our duty to establish that drainage instead of doing an external operation, if such seems necessary, yet in many cases internal drainage will be quite sufficient.

DR. ROBERT C. MYLES, New York City: The fundamental principle of these chronic cases, in my opinion, is the securing of proper drainage, and resolves itself into a surgical mechanical proposition. I think we have been a little conservative in not teaching more frequently these intranasal operations on the ethmoid and antrum of Highmore, in children under puberty. It is astonishing how a child can be trained to allow you to do it under cocain. I have started by opening the ethmoid cells, and before finishing have succeeded as well as though the patient were a grown person. I have used cocain frequently by hypodermic, and in this way it renders the operation quite painless if injection be made into the middle turbinal region. The exenteration of the bullæ ethmoidalis and the anterior ethmoidals has frequently been most successful. I believe we will be able a little later to open the antrum more successfully by enlarging the hiatus semilunaris and enlarging the upper lobe and securing drainage in that way, doing no permanent harm, but effecting permanent drainage, and thus paving the way for the future irrigation if necessary.

In a case of mucocoele, if you make a permanent opening through the nose you will get the best results. In cases of chronic suppuration, those preceding atrophic rhinitis, it has been my custom to find the drainage fairly good. I have used in conjunction with other treatment a powder of aristol and boric acid, insufflating half a grain once a day

into the nose, at night; and I do not know whether it is the iodine generated from the aristol or what it is, but it seems to me that the causal factor of suppurative rhinitis which terminates in atrophic rhinitis is sometimes completely arrested. In conjunction I use ichthyol as an ointment.

DR. G. ROSS SKILLERN, Philadelphia: It is astonishing how few cases have really come under observation and been diagnosed as such. I do not mean the acute cases, which we see in conjunction with the acute conditions, but the truly chronic cases. In the pediatric department of the hospital with which I am connected, there are a great many cases of children's diseases, and very frequently the laryngologic department is called upon to examine patients for sinus trouble, and in the last year I do not know of more than one or two well-marked cases of sinus trouble which we have been able to diagnose. This may be due to the fact that in the sinuses in children the mucosa and the underlying bone are so intimately associated and connected that we do not seem to have the same condition as shown in the textbooks pertaining to the adult, yet it seems that the cases are fulminating in type. In the operations we have done, mostly by the internal method, the bones are softened and broken down, showing a condition of infection of the entire wall of the nasal cavity of one or both sides.

In some of these bad eye cases it is absolutely necessary to go into the ethmoidals, but in the majority of patients we should try the intranasal method first, and the conservative methods, because at the best we are working under very disagreeable circumstances.

DR. HANAU W. LOEB, St. Louis: The most unsatisfactory class of case of any type that can come under our observation is that of bilateral suppuration which without definite proof seems to come largely from the accessory sinuses in children. The nostril is exceedingly small, so that it is almost impossible to get a satisfactory view, the nose being really a duct, and for that reason not sufficiently developed to take care of the situation.

DR. VIRGINIUS DABNEY, Washington: I would first refer to a trinity of symptoms in the acute cases. First, there is the high temperature, frequently 104 degrees, quite un-

associated with influenza or bronchial trouble. This, I think, is particularly remarkable when we remember the cause is an open empyema. Secondly, with regard to the prolonged convalescence. I have under observation a case which has been irrigated six times a day for ten days, with an immense amount of discharge. The case was not easily diagnosed; it was seen on the third day with an internist, but it was only by exclusion that we arrived at the diagnosis. Pressure on the canine fossa was painful, and also pressure over the supraorbital ridge. There was high temperature and all the train of symptoms which are recorded as typical, after three weeks of apparent cure. Under irrigation in these cases the temperature comes down to 99 degrees for ten days or so, then there is an exacerbation from a reaccumulation of pus. I would cite one case of a boy who went wading two weeks ago in a public fountain; no bronchitis; temperature suddenly shot up to 104 degrees. The pediatricist said he had colitis, etc. What he had was a pure infection of the antrum of Highmore, and this cleared up under irrigation.

DR. JOHN F. BARNHILL, Indianapolis: I believe that we should do more than we have done heretofore in enlightening the general practitioner and surgeon as to the exact cause and number of cases that may arise from sinus disease. If we attempt to find out how frequently meningitis results from these sinuses, we are greatly handicapped.

I have had an opportunity of seeing a number of cases in which there was lack of fever, pain and distress, the thing we did find being the great exophthalmos with swelling of the lid and discharge of pus into the nose. Recently I had a child of thirteen years, in which there were no symptoms except this great exophthalmos and discharging fistula at the external angle of the eye. At operation I found the entire anterior and lower wall of the sinus necrosed, and it had to be taken away.

Dr. Coakley spoke of doing a secondary operation, leaving an external drain in the cases operated on by the semi-Killian method. It seems to me that we should do this at one operation, by making the drain large enough into the nose.

DR. GREENFIELD SLUDER, St. Louis: The sphenoidal sinus

develops very early; specimens showed that by the completion of the second year of life the extension of the sphenoid, although scanty from anteroposterior measurements, was as far as the foramen rotundum laterally, and at the sixth year it had reached the vidian canal. Both the vidian and the second division of the fifth nerves come closely associated with the wall of the sphenoid, and I believe this fact offers the explanation for the recurring headaches in children which are sometimes seen as early as the tenth year; and I feel more convinced than I did last year, because during the interval I have seen the sphenoid put out an eye, and paralyze the third division, where the picture in a tractable child of ten years showed a polypoid swelling over the olfactory fossa, completely filling it, and bathed in pus from above. In the course of twenty-four hours that polyp disappeared under shrinkage, and the last vestige of pus with it. Under constant watching no further pus was found. In that particular case the second division of the fifth nerve and the vidian nerve took part in the pain. The treatment was satisfactory, the third division came back into almost complete function, although there is still a difference of two diopters prism. That case lost its malignant type as soon as the shrinkage took place. It was not operated upon.

DR. HARRIS P. MOSHER, Boston: Among the cases which have come to my attention, there have been two which I could not miss; in each there was a fistula under the eye which when investigated led to the antrum or nose.

Dr. Coakley's remarks regarding the slow pulse in acute ethmoiditis interested me. This suggests to me some cranial pressure, and I would like to know if that is his explanation.

DR. LEWIS A. COFFIN, New York City (in closing): I selected the eye department of our hospital as the one in which to try out my method. I took an old aspirating apparatus with a vacuum in a big bottle, and cut off the tip of a rubber ink dropper and stuck the little end into the tube. By putting this into the patient's nose we found the dropper filling up at once.

With regard to the type of case cited by Dr. Mayer, there is such a type. I have a different feeling from him

on the matter. I find that it is pathognomonic of an osteomyelitis and involvement of the alveoli, and the alveoli are diseased, and if probed it will bend toward the nose and will be easily pushed in. Very possibly the antrum is diseased also. The next case any one of you have I would suggest that you make a very careful examination of the alveoli.

In regard to the treatment of children intranasally, in taking out polyps, ethmoids, etc., we must differ very much in the class of children we treat. I could not do it in my patients under seven years of age; I do not own or know of sufficiently small instruments for this work.

In regard to the size of the sphenoid, there is a difference in Dr. Wood's and Dr. Mosher's statements. I have had some experience and believe that Dr. Mosher, who stated that the ostium was well developed with quite a cavity back of it at birth, is correct.

DR. GEORGE B. WOOD, Philadelphia (in closing): I would add just a word regarding the development of the sphenoid. In my own experience I have never seen a sphenoidal cavity under one year of age which I could recognize. I have cut sphenoids in children six months of age without the slightest sign of a cavity. Others state that it becomes of surgical importance from four to six years of age, and may be recognized occasionally as a dimple on the anterior edge of the sphenoid body during the first year.

DR. CORNELIUS G. COAKLEY, New York City (in closing): In the radiography of children there is certainly a frontal sinus well above the orbital ridge in children three years of age. One explanation may be that these children with discharge and diseased frontal sinuses may have abnormal development.

As regards the instruments for intranasal work referred to by Dr. Coffin, I would state that Pfau is now making instruments identical with those for the adult.

As to the size of the sphenoid, I had occasion to operate on a child with orbital cellulitis about a year and a half old, and there was a sphenoidal cavity the size of a hazelnut. The child died of laryngeal diphtheria three weeks later and we proved the size of this sphenoid at autopsy. Infection is more likely to come from the frontal sinus,

but in the clinic cases I have seen it has come through an orbital cellulitis. The frontal sinus has not been involved particularly, and I think that an orbital cellulitis secondary to sinus disease is the thing which is very liable to extend into the brain.

With regard to the low pulse, I would say that in two cases I have examined the spinal fluid and there has been no infection, and in twenty-four hours after, through opening of the abscess, the pulse has come up and run very high, showing that the slowness of the previous rate was probably due to compression. The bone in all these cases has been of peculiar leathery consistency, requiring a forceps to get it out.

I can agree entirely with Dr. Coffin in his explanation of Dr. Mayer's case. Such are due either to necrosis of the superior maxilla or ethmoid, which has ruptured spontaneously, and such cases go to the eye man.

These cases, so far as I have been able to determine, have usually been streptococcic. The reason I leave the wound open is because I would do so with a streptococcic infection in the mastoid, and I believe in the type of cases I am speaking of, tense, shiny glaze of the orbit, if you close the wound you are in danger of keeping up the cellulitis and producing an extension into the cerebral cavity. You frequently get no more scar following drainage, although it may be wider and redder for the first four or five months, yet at the end of the year you cannot tell whether it has been closed primarily or healed by secondary closure. I got this idea of leaving the wound open in such cases from Killian.

The Relation of the Tonsil to Thyroid Disease.

By BURT R. SHURLY, M. D.,

DETROIT.

For some mysterious reason there exists in the state of Michigan an area in which there is an increased percentage of cases exhibiting disturbances of thyroid secretion. It is obvious that the physiology of the thyroid and other ductless glands is profoundly affected by toxic disturbances in general, and particularly those that enter by

the lymphoid ring. The author has noted beneficial results after a tonsillectomy in patients who had incipient Graves' disease, thus adding another definite indication to surgical procedure.

When the routine examination of the nose, throat and ears includes the cervical and postcervical glands, thyroid and thymus, it may be possible to abort an incipient Graves' disease or pulmonary tuberculosis.

In moderate or severe thyroid insufficiency you may find a dry mouth and throat, with dyspnea on exertion. Voice husky or thick, defect or change in speech. Mucous membrane of upper air passages may be swollen or dry. Laryngeal muscles may show insufficiency. There may be perversion of taste.

Later in the disease hemorrhages from the nose, throat or lungs are common.

Treatment of the thyroid condition is indicated, but if improvement does not follow upon medical treatment, operative interference should not be postponed.

In all cases of thyroidism an examination of the nose, throat and ears is essential.

DISCUSSION.

DR. GREENFIELD SLUDER, St. Louis: I have started observations in the Children's Hospital in St. Louis, and a considerable number of children have been studied as well as adults, by me, in which there seem a clinical relationship between the lymphoid ring and the thyroid gland. The development of this district is by no means clear in the minds of anatomists. Just exactly what parts the various sections of the lymphoid ring develop is not settled. That the lingual tonsil develops from the same bronchial arch as the thyroid is a fact, and in early fetal life there exists the thyroglossal duct, which is closed before birth. It is sometimes found in the dissecting room. I have many times sought for this duct in the living, but have not found it.

Dr. Shurly reports a singular betterment by the removal of the faucial tonsils. My observations have been relative to the lingual tonsil, and in one case in which I did a perfect tonsillectomy some years ago I found a goiter this

winter. The treatment in that child with a lingual tonsil resulted in marked shrinkage of the goiter, which was a simple hypertrophy. I have a considerable number of adults under observation, one young man of probably twenty-five, with an enormous adenoma in his neck that in the course of three months has shrunk some three-quarters of an inch in circumference. The gland is softened and the sense of comfort is greatly increased. That is the type of simple hypertrophy. Of hyperthyroidism I have had five cases. In four there was marked improvement by applications to the lingual tonsil. One was a case of long standing, operated on once or twice, in a woman by no means intact otherwise, who has so far not been improved. In another case of high grade striking exophthalmos and moderate adenoma, with a sense of impotency and general nervousness and tremor to such an extent that the patient was unable a short time since to feed herself, in that woman the first application to the thyroid gland was followed by a sense of betterment which she described as less tension. In the other cases under observation the thyroid has softened and shrunk, and in one very distinct and another less distinct has the exophthalmos receded. In one case in a child I saw the thyroid swell over night as the result of laryngeal tonsillitis; the tonsillitis got well, and in a few days the thyroid returned to normal size.

With regard to the application, it is silver in varying strengths up to a saturated solution, and salicylic acid in alcohol in saturated solution.

DR. GEORGE B. WOOD, Philadelphia: The relation of tonsillar infection to the production of hyperthyroidism was first called to my attention by Dr. Musser, with whom I saw a number of cases. One case in particular was that of a trained nurse who had recurring tonsillitis and exophthalmic goiter and hyperthyroidism following tonsillitis. The removal of her tonsils stopped the attacks for six months, and her goiter began to go down and the exophthalmos disappeared. At that time she had slight sore throat, followed by a less severe attack of hyperthyroidism, and after this attack I found on examination that at the operation I had not completely removed the faucial tonsils, there still being a piece in the upper part, removal of which has cured her and she has had no more attacks.

I have seen a few other cases. The thought in my mind was not of the relation of the lymphoid ring directly with the thyroid gland, but rather that we had an infective process originating in the ring which upset the metabolism of the body so as to produce goiter and hyperthyroidism, and that was also the view Dr. Musser held, and he believed that almost all goiters and all cases of exophthalmos with goiter were more or less associated with some form of cryptogenic infection, and that if such infections could be located and removed, the results would be good.

DR. HENRY L. SWAIN, New Haven: I have long associated the two things together of the connection between the hyperthyroidism and the tonsillar ring, but I had only put them as occurring in the same individual, and that any infectious process in a patient with Graves' disease would exaggerate the symptoms. I have known this to occur with antrum disease, with lingual tonsils, and inflammation of the lateral columns of the pharynx. This I say in spite of the fact that there are numberless cases which must have occurred to all of us in which the relation was established in this way—that in patients treated for lingual tonsil affections we find they cannot wear a tight collar when there is an acute exacerbation of the lingual tonsils. I had not thought that they were directly connected and that any phenomenon of internal secretion could exist between the two conditions.

DR. GEORGE E. SHAMBAUGH, Chicago: Dr. Shurly's paper brings out a point of great importance, the necessity of associating ourselves in our work with other fields of medicine, especially with the internist and his work. We too often isolate ourselves.

We have been interested in these problems of Dr. Shurly's in the Presbyterian Hospital for a number of years, and our view has been along the line suggested by Dr. Wood, that there is a focus of infection in the throat which causes it. The whole phenomenon of thyroid disease has been that developed from an infection; it may be a bad tooth, an alveolar abscess, but usually it is an infection gaining entrance through the faucial tonsils. The recognition of a chronically infected tonsil is very often overlooked. With the history of recurring attacks of sore

throat, etc., anyone may recognize the possible relationship, but to find the chronic infection of the faucial tonsil is more important when there is no history of such disturbance. Sometimes the history is of an attack several years previously, and in such cases a pus pocket may be found which has given no symptoms. I have often been asked to remove the tonsils where the patient was suffering from systemic infection, since this was considered to be the source of entry; careful examination of the tonsils will probably show nothing externally to lead you to believe they are responsible, but after removal frequently an abscess will be found at their base.

DR. BURT R. SHURLY, Detroit (in closing): I would like again to call attention to the very great interest these cases should have for throat surgeons, and how frequently they are missed. Almost all the patients are of neurotic tendency, and such have an awful life to lead, and if we can find some few of them exhibiting these disturbances of the thyroid, it will be of great benefit to put these people on the right track.

Laryngitis Submucosa Subglottica Acuta.

By CHARLES W. RICHARDSON, M. D.,

WASHINGTON, D. C.

The writer gave a brief history of the condition, and why he preferred the name given to other designation of the condition. His attention was first called to this disturbance during the early days of his extensive intubation practice. The disease is most frequent in child life, though no age is exempt. The condition is apt to be implanted upon a severe laryngitis—a sequela of the infective diseases—or produced by foreign body or other sources of local irritation.

There may be more or less general inflammation of the larynx, but this is not always markedly present. The characteristic inflammation of the submucosa manifests itself in the subcordal portion of the larynx. The symptoms are manifested by slight hoarseness, often absent; by stridulous breathing, and by bellowing cough. There is not usual marked evidence of interference with aeration of the blood, as in diphtheritic stridor. The development of the embarrassment to

respiration is more gradual than in laryngeal diphtheria. Inspection demonstrates two bright red bands located immediately below the vocal bands, nearly or quite meeting in the middle line. This condition was differentiated from laryngeal diphtheria by the author.

The treatment indicated is quiet in bed, depleting by the skin and bowels, local use of ice externally, and silver nitrate in one per cent solution, if possible, and ammonium bromid, carbonate and tincture of aconite internally.

Intubation becomes necessary if the respiration is seriously embarrassed. The paper then terminated with the report of four interesting cases which required intubation.

DISCUSSION.

DR. THOMAS H. HALSTED, Syracuse: As I understand it, there is palsy of the vocal cords in the subglottic region and deposition of lymphoid tissue which becomes actively inflamed and hypertrophied at times, just as do the tonsils in the upper part of the throat, and I have always felt in these cases that we have an acute inflammation of that tissue. And therefore it has seemed to me that in the cases which I have seen most commonly they were in children with enlarged tonsils and adenoids, that is, the children would have recurring attacks. These cases are always, especially when severe, anxious ones, because there always comes up the question of possible diphtheria, and the general practitioner usually makes a diagnosis of diphtheria in the more serious cases, and it is a serious matter for us very often to oppose that diagnosis.

DR. BURT R. SHURLY, Detroit: Ordinarily I think practitioners differentiate between acute laryngitis and membranous laryngitis, and this particular condition is not one that is ordinarily differentiated. Those of us that have done intubation work realize the peculiar conditions found in the subglottic region of the larynx, and the loss of voice in these cases is apparently the thing which attracts our attention to this variety of laryngitis, and one which would put us on our guard as to the proper differentiation. Of course, these cases for the most part are those which are met in the homes of patients, and the difficulties of examining and actually observing the swollen ring is a thing which is quite apparent,

and usually we have been called to these cases to do an intubation or for some operative interference for a case of membranous laryngitis. The danger of not differentiating is a very great one, because by far the high mortality would come on the side of the membranous form of inflammation. I have intubated a number of these cases that were decidedly urgent, and where this was the only thing to do to save the life of the child, and practically all these cases got well with intubation. The point of doing a sufficiently early intubation is well taken, from the fact that a child suffering from long continued dyspnea is in great danger of developing a pneumonia or some pulmonary condition. Of course, the differentiation from a foreign body is also a thing which should be prominently in mind.

DR. EMIL MAYER, New York City: There is one condition that has not been brought out, which is exemplified in a case under my care. A nurse in the Mt. Sinai Hospital had a good deal of dyspnea, and it was suspected she had diphtheria, although the cultures were negative. She was placed at once in isolation, where I saw her. Examination of the larynx showed the swelling Dr. Richardson has mentioned, and I felt it might show itself to be a case of subglottic infiltration. Nevertheless, I took the swab of the ordinary diphtheria culture outfit, bent it at right angles, and introduced it below the cords into the trachea, and got the cultures of Klebs-Loeffler bacilli there. There was nothing high up in the larynx, but it was in the trachea. She went through a most terrible time, but eventually recovered.

In regard to the treatment, I do not recall that Dr. Richardson brought out the great benefit from small doses of adrenalin applied directly to the parts, and when the acute inflammation has subsided, the advantage that iron applications produce in the healing of these conditions as the patient improves.

DR. WILLIAM E. CASSELBERRY, Chicago: I am certain that this disease is deserving of a name of its own, and that it should be described as an entity. It is not always a false croup, or nondiphtheritic croup, or spasmodic laryngitis; the distinction which he makes is as to the progression of the dyspnea—the constancy is the best clinical distinction between the entity of subglottic laryngitis and the other forms just named. In subglottic laryngitis there is often that swelling

beneath the cord, but when the condition is not at its worst the child breathes freely, especially in the day time, and the attacks are paroxysmal. In the membranous form you cannot be so certain, because the membrane covers the subglottic portion, but on the wane and in the beginning I have seen the subglottic inflammation.

The disease is by no means limited to children, even in those instances in which they may be taken for angioneurotic edema. I have seen several well pronounced cases with fair voice and continuous dyspnea in adults. I remember a woman who came to me with the history that she was subject to croup which would last about a week and she would feel that she must suffocate. She had been intubated on more than one occasion, as I recollect. The mirror showed a typical picture of subglottic laryngitis.

DR. HENRY L. SWAIN, New Haven: Thirty years ago, when I first yearned to look into a larynx, there were certain cases known as choroiditis hypertrophica inferior; they went through acute exacerbations. Since then I have seen these cases in adults where they have the history of attacks of choking. I always thought them acute exacerbations for which there seemed no very good remedy. In two cases I remember using almost full strength nitrate of silver, and in one the galvanocautery, but I reduced the chronic hypertrophy only very slowly.

DR. THOMAS HUBBARD, Toledo: This condition is more common than is usually supposed. I have three cases in mind which I labeled subglottic edema in children. Two were treated in the routine way, as though diphtheritic; the antitoxin made no difference, but in two cases in particular there was a copious flow of serum immediately upon the introduction of the tube, and there was such a quantity that there was no mistaking it. Diagnosis with the mirror I have also made, and I would take issue with the method of treatment as stated by Dr. Richardson. I think the proper line of treatment should be copious diaphoresis; if we could establish this when sure of the diagnosis, it is the best remedy. In one case where the diagnosis was made with the mirror, this treatment was very promptly successful.

DR. CHARLES W. RICHARDSON, Washington: I wish first to endorse what Dr. Casselberry has said. He suggests pass-

ing the mirror into the pharynx and raising the epiglottis in order to get a rapid view.

Really, although Dr. Hubbard thinks his treatment differs from mine, he agrees most thoroughly, because my method of treatment also produces diaphoresis.

Recurrent Lymphomata of the Laryngopharynx—Presence of Streptococcus Hemolyticus in the Growths Excised and in an Associated Sphenothmoidal Discharge—Autogenous Vaccination—Arrest of Recurrence—Recovery.

By W. E. CASSELBERRY, M. D.,

CHICAGO.

A causal relationship between nasal sinus disease and tonsillar and other lymphoid enlargements of a certain type, believed prone to affect parts over which the discharge flows, is substantiated, to the extent at least that manifold extreme enlargements of isolated lymphoid glands of the laryngopharynx were found to have been excited and maintained in chronic form by infection with streptococcus hemolyticus derived from a sphenothmoidal discharge which contained the same organism. The fact is significant in connection with the modern conviction that rheumatoid, cardiac and pyemic diseases lead out from local foci of infection, as it shows the necessity of searching for the focus "higher up" than the tonsils, since tonsillar infection itself may be secondary to nasal sinus disease. It supports also the conviction that secondary infection is the cause of the gross hyperplasia of the follicles in the fossæ of Rosenmüller, and of the lymphoid infiltration of the folds of tissues about the eustachian tube, which are observed in connection with sinus discharge, and which lead to deafness by obstruction.

The term lymphoma is used synonymously with infectious lymphoid swelling. In size and shape they were not unlike clusters of large white grapes, ranged on each side of the laryngopharynx, where they filled the pyriform sinuses, overrode the arytenoids and encroached upon the lumen of the larynx. There were in all six separate and distinct growths arranged in three pairs. Each of the upper pair consisted of two lobes, one above, the other below the side of the epiglottis, and was attached to the

pharyngoepiglottic fold. The middle pair, somewhat smaller, was attached to the aryepiglottic folds, and the lower still smaller pair to the arytenoids; the latter suggests that other instances of slighter degrees of hyperplasia about the arytenoids, observed in sinus suppuration, and classed as chronic laryngitis, really represent secondary infection of the lymphoid glands by the sinus discharge which gravitates to that situation.

The faucial tonsils having been totally enucleated years before, would have caused the upper pair of lymphomata, only their upper lobes at first being visible, to have been mistaken for compensatory growths, were it not unprecedented for the isolated follicles in the laryngopharynx so late in life as fifty-four years of age, to develop spontaneously without definite cause into overgrowths so unusual in multiplicity, size and situation.

Meanwhile the microscopist reported: "A simple hyperplasia of lymphoid tissue corresponding to that of the tonsil. No evidence of malignancy." And the bacteriologist reported the presence in the tissue, in large numbers and almost pure culture, of streptococcus hemolyticus, the same organism which recently had caused epidemics of severe acute infection of the throat and cervical lymphatic glands, and reported also that the sphenoethmoidal discharge contained, among others, the same organism.

Nine months from the start the dyspnea, choking spells and impairment of voice required surgical relief, and all but the right one of the middle pair of growths were removed. But they soon redeveloped, despite external exposures to the X-ray.

It was in face of this discouraging prospect that hopes were centered upon autogenous vaccination. All other treatment was suspended, and despite the fact that one of the middle pair had not yet been removed surgically, it was now let remain to serve as a gauge by which to mark the efficacy of the vaccine. Its successful effect furnished practical confirmation of the infective origin of the growths. The result of the first dose was comparable only to that at which one marveled in the early days of diphtheria antitoxin. The change commenced within twelve hours, with relief from irritation in the throat, and was marked

within two days by a visible diminution in size of the lymphoma which had been let remain as a gauge, and of the large recurrent growth at the site of the first one removed. The further recession under biweekly doses was uninterrupted down to a practical and permanent disappearance of all the growths in about six weeks.

DISCUSSION.

DR. JOSEPH L. GOODALE, Boston: I am very much interested in this case, as I am reminded of one which I saw several years ago, and which I reported the following winter in Philadelphia, which bears certain resemblances in this respect. A woman whom I was asked to see showed an enormous enlargement with induration of the left tonsil, the induration continuing behind the tonsil and without any sharp line of demarcation to the base of the tongue and down the vault to the larynx, rapidly increasing so that from the beginning of the symptoms to the time when I saw her it had produced actual dysphagia, and the question was whether we should do a tracheotomy or remove the growth, and in examination under ether the growth was found so extensive that we decided to let her come out. During the next week, although we had practically decided the condition was hopeless, we endeavored to excite an autogenous vaccination by the injection of turpentine under the skin. That was perhaps the wrong thing to do. At the same time we gave her the staphylococcus aureus. The result was that within three days she was able to swallow. Within a week she could breathe perfectly. This was in May; when I went away the last of June she had left the hospital, and examination showed nothing in the situation of the former growth. When I saw her again in the autumn the site of the growth was represented by a stellate cicatrix. She then disappeared from observation; I saw her last spring; she has been in perfect health, no difficulty of any sort, but at present there is not the slightest sign of lymphoid tissue in the tonsil fossa. It looks as though a complete and beautiful enucleation had been performed.

DR. WILLIAM E. CASSELBERRY, Chicago (in closing): The sphenothmoidal discharge during the course of the treatment diminished tenfold. It never was entirely eradicated,

but it is now so slight in comparison that the patient esteems it as not one-tenth of its previous quantity. There has been no further treatment.

With regard to the removal of the growths, the upper ones were done without a mirror, by extreme depression of the tongue with the patient's head directed upward, getting hold of the growth with a volsellum and pulling it up and getting the snare up. The fourth was done in much the same manner, but under the mirror. Grasped first with the volsellum under laryngoscopic observation, and then the snare put over it also with laryngoscopy. The patient started to gag, the mirror was removed, and under traction the snare was drawn home. The others were simple enough to do without traction under laryngoscopic observation.

The Use of Radium in Papilloma of the Larynx in Adults.

By F. E. HOPKINS, M. D.,

SPRINGFIELD, MASS.

Dr. Clark's paper, read before the Association in 1905, brought out very clearly the tendency to spontaneous disappearance of papilloma of the larynx in children when the age of active growth has passed; but the tendency toward recurrence is more persistent and is a more desperate one in the adult. Radium has been applied directly to the larynx in no great number of cases as yet, but with some positive cures reported. More than a single application may be necessary, and burns from too long exposure with consequent adhesions and contractions are possible. Caution is advised as to the length of exposure when a powerful tube is used, and a necessity for more than one application is to be borne in mind.

Report of a Case of Septic Infection of Parotid Glands.

By F. E. HOPKINS, M. D.,

SPRINGFIELD, MASS.

Structure and anatomic relations account for the prominent symptoms attending great swelling of the parotid gland. Each intralobular duct is a branch of a subdivision

of the main duct, so that if a septic infection results in closure of these ducts, drainage is impossible and dissection of the gland becomes necessary. Many important vessels and nerves, including the facial, traverse or originate within the substance of the gland, making dissection difficult and dangerous. The gland lies in contact with internal jugular vein and internal carotid artery and the pneumogastric, glossopharyngeal and hypoglossal nerves; and pressure of the distended gland causes corresponding functional disturbance. Suggestions for treatment are early probing of Steno's duct and efforts to reduce inflammation, which failing, dissection of gland becomes necessary.

DISCUSSION.

DR. HENRY L. SWAIN, New Haven: Dr. Abbe stated in New Haven recently, in speaking of the treatment of tumors by radium, that he had one case without recurrence after five years. It has occurred to me since I have been using suspension laryngoscopy, that we have in it an admirable method of exposing these papillomata over long periods to radium. The patient is hung up with an anesthetic, and kept so comfortably for so long a period that we can radiate them at our pleasure. Dr. Mayer exhibited patients under suspension laryngoscopy. The other day I had a case hung up for over an hour with insufflation anesthesia through the nose, breathing perfectly and without any after-discomfort.

DR. D. BRYSON DELAVAN, New York City: Radium is especially applicable to superficial growths, and papillomata of the larynx are very frequently of this class, and should be susceptible to relief from the use of radium.

Without some such help as suspension laryngoscopy, it is practically impossible to make an exposure of the radium for sufficient time to answer the purpose. I have had under observation for six or seven years a little girl, a case of Dr. Abbe, whom I began to treat with him when she was about five years of age. I refer to the case, not because it has been an inveterate case of papilloma, but because the radium has not been as effective in this instance as in almost every other case I have seen, and I would particularly refer to one result—not of the radium treatment,

but one which has followed in the case perhaps from influences due to the growth itself—that is, the distinct contraction, especially of the epiglottis; a contraction so marked as to be quite unusual. There still remains a large mass of papillomatous tissue at the base of the epiglottis, and the child still is able to breathe most of the time through the mouth, but is occasionally forced to resort to the laryngeal opening, which is kept packed. The contractions which have arisen are worthy of attention.

DR. FREDERICK E. HOPKINS, Springfield (in closing): I think I may fairly say that my conversation with Dr. Abbe makes me feel one can speak much more positively about the efficacy of radium than I felt warranted in stating from my own experience in my one case. He has used it for fully ten years, and has many cases of undoubted cure. The woman referred to, who was treated so long, has since died, but she lived for three years after the application of radium, dying with pneumonia, I believe, and during that period of three years she breathed comfortably, with no recurrence of the growth.

The Influence of the Nose on Eye Affections as Evidenced by a Case of Bilateral Blindness and One of Unilateral Scintillating Scotoma Cured by Operations on the Ethmoid Cells.

BY HANAU W. LOEB, M. D.,

ST. LOUIS.

Case 1 was that of a boy who was practically blind, the vision being reduced to 1/192 on the right side and 3/120 on the left side. The sight had been gradually failing for three weeks. This was accompanied by severe supraorbital headache. Exenteration of both ethmoids was followed by complete restoration of vision within one week, improvement being gradual from the time of operation.

Case 2 was that of a girl, sixteen years of age, who had been suffering for two years from daily attacks of severe left-sided headache, with what she described as flashes appearing in her left eye. These attacks lasted for about five minutes, coming on without any apparent regularity during the day, and without any cause ascertainable on the part of the patient. Exenteration of the left ethmoid

resulted in complete cure, the patient having suffered with only a mild attack on the day of the operation.

Dr. Loeb thinks that these cases, in which the ethmoid and not the sphenoid was at fault, may confirm his investigations on the anatomy of this region, to the effect that under ordinary circumstances the optic nerve is in close relation with the ethmoid labyrinth only at the postero-external angle of the last posterior cell. Where this relation exists, there is only the slightest possibility of any danger to the optic nerve in suppuration confined to the ethmoid cells. But when the last posterior ethmoid cell replaces the sphenoid, the optic nerve runs close to and along the external wall of this ethmoid cell (as in two out of thirty specimens studied), and the vulnerability of the nerve is correspondingly heightened in view of the greatly increased portion exposed.

DISCUSSION.

DR. JOSEPH H. BRYAN, Washington: In my experience it is the posterior ethmoid cells which are most at fault at the juncture of the sphenoid, or the posterior ethmoid cell operating on the optic nerve as it comes through the canal. These cases where the wall between the sinus and the orbital cavity is very thin, naturally may be due to some pressure effect, but when distantly situated, with considerable bone between the cavity and the nerve, it is rather difficult to explain, unless due to toxins, and it is my belief that there is some transmission of the septic matter to the nerve tissues which bring about these changes.

DR. JOHN F. BARNHILL, Indianapolis: In a study of this question I came across a specimen which was unique. I could well believe that anything could happen to the optic nerve in a case of ethmoiditis posterior in such an instance. The specimen shows that the whole optic canal runs entirely through one of the posterior ethmoidal cells much as would a sewer drain run through the ground. It is attached at the base of the cell, and with three-quarters of the circumference of that osseous tube runs directly through. It seems incredible, looking at the very thin bone which surrounds the bones throughout this half inch in length, that if this cell were filled with pus and the

drainage impeded, such an eye would not be affected in some way, as Dr. Loeb has explained.

DR. B. ALEXANDER RANDALL, Philadelphia: I have seen a good many of these cases, some of them of great interest; but all of these where the scotoma was scintillating, I have seen to be distinctly toxic in type and not dependent on anatomic relations. I have seen the blindness and fixed scotoma quite marked with marked swelling of the optic nerve.

DR. HANAU W. LOEB, St. Louis (in closing): Ethmoid disease is more common than sphenoid disease, and when the latter sinus is affected the ethmoid is also, especially in the acute conditions. I found in these anatomic studies that this last posterior ethmoid cell at its posteroexternal angle came the nearest to the optic nerve. Knowing, as we do, that the orifice of that is low down and almost always empty of pus, with that slight relation it would not affect the nerve to any considerable extent, even if it is possible for the nerve to be affected by nearness. However, in two cases out of the thirty specimens, this nerve, instead of having that relation, on account of the ethmoid cells being pushed back over the sphenoid ran along the posterior ethmoid cell and along its lower portion, and was in a far more vulnerable position than before. Onodi has ascribed to the toxic condition the cause of optic troubles, or to the veins. Toxic conditions can act more accurately under these conditions than when distant. The anatomic relations of these structures have shown that this condition obtains.

Too Optimistic Rhinology.

By B. ALEXANDER RANDALL, M. D.,

PHILADELPHIA.

Important, often essential, as is rhinology to laryngology and otology, it is often inadequate and must be supplemented by strictly ear treatment in ear cases, where exhaustive diagnosis may show other conditions, such as nerve deafness, outweighing the catarrhal phases. The aurist sees many cases harmed rather than helped by rhinologic treatment alone. "It is a narrow and distant view of the ear that is gained with the throat mirror only."

The catarrhal process originating in the nose and nasopharynx may be impossible to cure unless these be put in order; but may progress unchecked, or at least persist, despite the best work here. Deafness sometimes clears up after adenoid removal; but "signing the pledge will not cure a hobnail liver."

Intrinsic Cancer of the Larynx; Complete Excision Apparently Effected by Endolaryngeal Operation.

By ST. CLAIR THOMSON, M. D.,

LONDON.

The treatment of intrinsic cancer of the larynx by laryngofissure is remarkably satisfactory.

The writer never lost a patient by operation, and 80 per cent have remained free from recurrence; similar results were secured by Semon and Butlin.

Thomson records his first case of endolaryngeal cancer that he has treated in a woman, aged fifty-three, hoarse for eight months.

The right vocal cord, from the anterior commissure back to the vocal process, was replaced by a reddish cauliflower growth, interfering somewhat with the movement of the cord.

Under cocain, with a large Mackenzie forceps and the indirect method, as large a piece of the cord as possible was evulsed. It proved to be epithelioma.

Some time later anesthesia was induced by intravenous infusion of ether and hedonal. Laryngofissure; removal of the right cord ventricular band with their perichondrin together with the vocal process of the arytenoid cartilage. Examination of this mass showed no evidence of epithelioma, indicating that the entire diseased mass had been removed at the first operation.

This writer concludes:

1. Cancer of the vocal cords in the early stages is strictly limited and very slowly progressive.
2. Diagnosis is based chiefly on inspection of the larynx. Where the growth is superficial and not infiltrating it can be confirmed by microscopic examination.
3. The growth may be completely removed endolaryn-

geally, even when it occupies the entire length of a vocal cord.

4. Laryngofissure is the operation of choice in all cases of endolaryngeal cancer, is not a dangerous operation, and offers the best prospects because the disease remains superficial and limited for a time; and finally, there is a lasting cure in 80 per cent of the cases. The value of indirect laryngoscopy is strongly insisted upon as being far gentler than the direct method, and it is hoped that the rising generation of throat surgeons will continue to practice the indirect method.

The anesthesia given in the case cited, while perfectly ideal from the operator's point of view, gave much anxiety subsequently, as it was difficult to rouse her for twenty-four hours after. In recent cases he has returned to chloroform.

DISCUSSION.

DR. CHARLES W. RICHARDSON, Washington: The laryngofissure claims to have its origin from Dr. Sanger of Berlin, but the first I heard to mention that manner of removal of laryngeal growth was Dr. J. Solis-Cohen. Whether he is the originator of it he can tell us.

One case which I have had is now five or six years without any recurrence. Most of my others have had recurrence, but singular to say, only one of recurrence *in situ*. There were secondary developments in other portions of the body to which they have succumbed. I have had two this winter—one that I operated on in the latter part of November or December, and as I had to go down quite far into the cricothyroid membrane in order to insure absolute removal in normal tissue, there has resulted some stenosis. This has been intensified by the fact that I had a hemorrhage at the end of operation; not a very severe one, but a persistent oozing in the lower corner between the arytenoid and the lateral wall of the thyroid cartilage, requiring opening up of the wound and watching of the hemorrhage for some little time. As a last resort I had to use chromic acid, which also produced considerable softening and necrosis of the left wing of the thyroid cartilage, which no doubt has produced this stenosis. He is wearing an intubation tube and is perfectly comfortable without any recurrence,

but is so distressed at his inability to get rid of the tube that he has gone to consult some of my colleagues at Johns Hopkins.

The second case of this year was identical with the first, and there was an identical hemorrhage which was controlled much earlier than in the first case. After I had controlled the hemorrhage and waited about half an hour, I returned to the man to see if he was perfectly safe to leave, and I found that he did not seem to recognize me, or show any interest in anything. In picking up his hand to feel his pulse I noticed the left arm was apparently inactive, and testing further I found the left arm and leg both inactive; the right side was free! Three or four days later he died from his hemiplegia; no postmortem was obtained. He was a man of seventy years, and probably this was a natural sequence in such a case. All of my cases I have operated on without primary tracheotomy, simply laryngofissure according to the technic suggested by Cohen, splitting the larynx and making the mucoperichondrial separation so far back as the growth extends in every direction and cutting off the mass.

DR. J. SOLIS-COHEN, Philadelphia: I have done a number of these operations and have never seen a recurrence. I learned to split the larynx from our old member, Ephraim Cutter. I saw him in Boston take out a large epithelioma in 1867. This man lived for twenty-five years and died of apoplexy.

My operation differs a little from his. I cut down, make the incision through the perichondrium all around the growth, and then with a blunt elevator lift the parts up. Then with a curved serrated scissors the whole mass is taken up, perichondrium, mucous membrane and growth, and the growth itself is not touched at all with any instrument. I have done preliminary tracheotomy in my earlier operations, but I have done one or two cases without. I prefer preliminary tracheotomy because I think it is well to get the patient accustomed to the use of a tube in case this becomes necessary later. All my operations were performed under chloroform.

I heartily endorse the conclusions that have been presented in the paper, both as to the ease with which certain

classes of growth are removed by intralaryngoscopic method, and the conclusions that have been arrived at by the writer.

Hemorrhage has been insignificant in my cases.

DR. EMIL MAYER, New York City: As a new contribution to the question of anesthesia I would like to call attention to the anesthesia proposed by Gwathmey of the injection of ether into the intestinal canal, producing a perfect anesthesia, the excess being drawn off after the operation. This is still in its infancy, but is very well spoken of, and it may be possible that in this we have a newer method of producing anesthesia, avoiding the necessity of a preliminary tracheotomy, and operating under ether.

DR. D. BRYSON DELAVAN, New York City: Again, I am proud and happy to know that America is still in the lead, but as to the subject of thyrotomy it is necessary to mention the name of Clinton Wagner, whose cases in the '80's show a comprehension of the subject and success in relation to it which is deserving of recognition today. With regard to the recurrence of malignant disease in these cases after operation, it is quite true that recurrence is unusual, yet I have seen several cases in which it has taken place. There is one case in particular, of primary epithelioma of the epiglottis, in which the disease was apparently far and widely removed, in which the patient lived for nine years without recurrence, then it took place and he succumbed. The fact that recurrence does not take place in many cases cannot insure the patient against it. It seems possible to me that where it should take place is in the cases that have not been appreciated as of the severe type, or else that the operation has not been thoroughly performed, but in the main the experience has been such as that stated in the paper and by Dr. Cohen.

DR. T. PASSMORE BERENS, New York City: I wish to lend emphasis by referring to this case of Sir St. Clair Thomson. He said he had removed his growth entire by the indirect method. In a case that I reported about six or seven years ago, at the same time Dr. Richardson had his, I also removed the cancer entire by the indirect method. There was so much induration following the operation that I did a laryngofissure and hemilaryngectomy, removing the

whole wing of the thyroid. The growth I found during the laryngofissure proved to be simply inflammatory. The cancer itself was removed by the indirect method. The man has made a perfect recovery. A patient should be prepared for operation by being taught to lie on his stomach, well over toward the side of the bed, with his elbow on a chair and taught to swallow upward. This has added greatly to the comfort of the patient, and I believe, also to the quickness of their recovery.

DR. GREENFIELD SLUDER, St. Louis: I would like to add a final word in the form of a plea for the indirect method. I personally regret exceedingly to hear it spoken of as a lost art.

DR. HARMON SMITH, New York City: I think we are indebted to St. Clair Thomson for giving us the history of this peculiar and interesting case. It is not always that our foreign confreres are willing to submit to our consideration and discussion their most important and unique cases. This is a comparatively young woman, removal by the indirect method, although an accident, being complete in its character, recurrence of a granuloma which to the majority of us would simulate a recurrence of the growth, his absolute faith in the pathologist that it had been removed thoroughly, not losing his head and removing the large mass which recurred, all these points seem factors that stand out prominently in the history of this case.

DR. JOHN E. McKENTY, New York: It seems to me, so far as my experience goes, that in small unilateral growths of the larynx laryngofissure is sufficient, but where the growth is at all progressive or extensive or growing fast, I am in favor of removing not only the growth, but the cartilage underlying it, either taking a wide section out of the larynx or doing a hemilaryngectomy. I do the tracheotomy and the hemilaryngectomy at the same time, and in that way may probably be going against the experience of others, as it is generally considered better to do the tracheotomy first; but if done through a small incision just above the suprasternal notch, and the laryngectomy through an incision which does not connect with the fissure below, there is not much trouble. Another point, to prevent inhalation pneumonia, is that after doing the hemi-

laryngectomy I pack the trachea tight down upon the tube with vaselined gauze impregnated with bismuth, then I use a small drain into the larynx brought out at the lower corner of the laryngofissure wound. In that way the larynx is drained of secretion, and this secretion is prevented from getting into the lung and causing pneumonia. I do not believe the position in bed is sufficient to prevent this when the larynx is closed after hemilaryngectomy. The drainage is removed from the larynx in two days, and the gauze packed down on the tube is removed also and the intubation tube taken out four days after the operation. I have had four cases prior to two recent ones, of which I will not speak, in which the patients made excellent recoveries, and have been able to talk in a loud whisper. I think we ought to be very proud of the fact that Dr. Solis-Cohen has opened the way of doing laryngofissure and has given us this excellent operation in cancer of the larynx. Anything that will avoid total laryngectomy is a Godsend. I saw in a clinic abroad two years ago thirteen total laryngectomies, and the patients were in many instances in a pitiful condition. The operations were all successful so far as the immediate result was concerned—the Gluck operation was done—but the pathetic condition of the patients struck me that life would hardly be worth living after a total laryngectomy, and if we can get results by an early operation, such as Solis-Cohen and Sir St. Clair Thomson have told us of, we will be very glad to adopt these methods instead of the more radical ones.

**Endonasal Operation in Tumor of the Hypophysis—Report of a Case
in a Female Nine Years of Age.**

By T. H. HALSTEAD, M. D.,

SYRACUSE.

The patient first seen February 6, 1914. The prominent symptoms were adiposity, frontal headache, impairment of sight, tiring very easily, muscular fatigue, marked ataxia, dizziness, intention tremor, extreme difficulty in making co-ordinated movements. Skin dry and coarse, hair black, coarse, growing low on forehead. She was mentally acute, described as being almost brilliant. There was an in-

creased tolerance for sugar, no glycosuria after 200 grams glucose, slight pyrexia. The eyes showed 6/9 + each eye, sight occasionally obscured, fields normal for form of each eye, color fields normal. Pupils large, in dark room no reaction to light, but in very bright light moderate change. Reaction with convergence normal. Muscle balance normal.

Patient is short, thick set for her age, tendency to adiposity, particularly about hips and abdomen, facial expression flat and ironed out, well marked general ataxia, marked choreiform movements, marked athetosis, decided intention tremor, some deafness but not persistent.

X-ray examination—stereoscopic plates—showed sella turcica somewhat larger than normal, bony outlines irregular and not as clear cut margins as other outlines in this area. Above and posterior to sella is a brain area of lessened density, fairly well defined, the anteroposterior diameter one and one-half inches, vertical about one inch. This area seems to surround the sella turcica, the interpretation being a soft growth, possibly a cyst, surrounding and pressing upon the pituitary body. The diagnosis was a cyst either of the hypophysis or a neighborhood cyst pressing upon the hypophysis, the optic thalamus, corpora quadrigemina and contiguous regions forming the interpeduncular space.

Preliminary operation March 13, 1914, upright position, cocaine, adrenalin. Removal of both middle turbinates and exenteration of right anterior and posterior ethmoidal cells.

Second operation, anesthesia, local, submucous resection of the septum, entire septum, vomer, perpendicular plate of ethmoid and the rostrum of the sphenoid were removed. Anterior wall of both sphenoid and sphenoidal septum removed.

Nineteen days later third operation, posterior third of the soft, bony septum removed, then the bony sella, the dura incised, and there was an immediate gush of more than a half ounce of yellowish fluid.

During the week following the last operation there was a very marked change in her condition for the worse. Frontal headaches increased, shrieked a great deal, much stupor, dull, apathetic, involuntary urination, polyuria, two

tonic convulsions, pulse irregular and thready, respiration at times slow and of Cheyne-Stokes type. At end of a week, following the convulsions, gradual improvement began, a very marked improvement in the ataxia and athetoid movements being first noticeable, pupil contracting, headache less, but there was a decided change for the worse in her disposition. Loss in weight and in muscular strength very perceptible, involuntary micturition and defecation. This decided change in symptoms, some better, some worse, continued for three weeks, and seemed to be due to the relief of pressure in interpeduncular space, as shown by improved eye conditions, less headache, less ataxia and intention tremor, whereas there was seemingly now a condition of hypopituitarism instead of the hyperpituitarism when she entered the hospital. For four weeks it was noticed that her black hair was changing color rapidly to a reddish brown, beginning at the distal end of the hair and extending rapidly to the scalp.

She was now put on pituitary extract—pituitrin—when there began an immediate improvement in her mental condition, the child becoming bright, cheerful, singing happily, displacing the apathy and dullness following the last operation. Muscular strength showed an equal improvement. No complaint of headache. But ten days have elapsed since giving the pituitary extract, and the report of the case, consequently, too short a time to know how much real and permanent improvement may follow the operations.

DISCUSSION.

DR. LEWIS A. COFFIN, New York City: I have operated two of these cases, practically doing the same operation that Halsted has reported, excepting that I take out the posterior part of the septum instead of doing a submucous resection. I took out the rostrum and got to the sphenoidal wall in that way. They were done in two or three stages. The first case was a woman, an idiot, that was referred to me from a charity hospital, and I operated her in three sittings. She was a poor patient under cocaine, because she had no mentality, but I was successful in getting back as far as the sphenoid. I went into her sella and put her back in the ward. Her symptoms as to pain in the head

improved, but her mentality did not. Some ten days after I had done the operation I felt more or less chagrin because I had not any of that tumor in a bottle for examination; it was a cyst, there being a gush of straw-colored fluid. It had become so easy to go into the sella turcica that I thought I would go in with curved forceps and get some of the tumor. I put her on the table under an anesthetic, and took Yankauer's right and left forceps, somewhat curved, and opened the sella turcica, closed my forceps, and took out what I thought was the tumor; there was a small hemorrhage. I packed right into the opening in the sella. I put her back in the ward feeling pretty well. Two hours later the patient was not so well. She was comatose, evidently from brain pressure. I removed the packing, but she died that night. Another case was sent to me from the eye clinic of the Manhattan Hospital, a young girl of seventeen, who had complete blindness in one eye and temporary hemianopsia in the other, with extreme and constant headache. I operated under cocaine, removed the posterior half of the septum, opening the sphenoid, and took down the sphenoidal septum under cocaine. I then, instead of inserting a plate, took her up to the X-ray room, and took a periosteal elevator and slipped it into the sphenoid, and without any light whatever, and put a little adhesive around it to hold it under the X-ray, and found the periosteal elevator was exactly where I wanted to enter the sella turcica; I then put her back on the table, opened the sella, could see the tumor very well indeed, but could not get any tissue. It seemed to break down, and I was not so ambitious to get any of it in a bottle as I had been before. However, just as she went back to the ward I took a curette and slipped it in there and put her back in the X-ray room and X-rayed her under ether, which showed my curette in the middle of the pituitary gland. That girl improved very much, not in vision, but her headaches disappeared. The interesting part is when she had gone out of my hands. She was coming to me for probably three or four or six weeks; she felt very much better; Dr. Sharp, who is consulting neurologist to our hospital, who worked for a number of years with Dr. Cushing, said we were not warranted in doing anything further

for her. I was looking for a case where I could do the Frazier operation, but this was not justified in this unless her headaches returned. Her sister, however, wanted her vision improved, and took her to several other men. Dr. Elsberg, Dr. Charles A. Dana, etc., saw her in the course of time. I asked Elsberg if he ever operated her to notify me, and some two weeks later he sent me word he was going to do the Frazier operation. I went to see the operation. I was delighted with his wonderful and beautiful technic. He did not, however, remove more than the size of a grain of rice. I do not know her recent history.

DR. CORNELIUS G. COAKLEY, New York City: I saw one case operated on of a man who was totally blind in the left eye, with hemianopsia on the opposite side. Elsberg did the operation, a decompression, but a decompression above the optic nerves. If you are going in for decompression you have your growth below the optic nerve, and pushing the nerves upward, and here semiclassical decompression is of far more value than decompressing the lower portion of the floor of the frontal lobe. The Frazier operation is not so satisfactory as the Hirsch or Cushing, or as the regular decompression operation.

DR. HARRY L. SWAIN, New Haven: I too have seen an operation and assisted at one for pituitary tumor in the hands of a general surgeon. What impressed me was the smallness of the view of the tumor mass. The operation was done skillfully enough; the nose was taken off at the face and turned up to the forehead, and fastened with towels, and the septum taken away, set back, the sphenoid opened, and the septum between the two sphenoidal sinuses taken away, and a good operative field cleared up. When all is considered, the range of light in surgical amphitheatres is not enough for a clear view of the further wall of the sphenoid to enable one to open into the sella turcica. The first stroke of the chisel opened into the sella turcica, and enough was chipped out to enable us to look through at the cranial cavity; there was a growth, not a cyst, of organized tissue, and it was supposed to be a glioma, although this would be very rare in this situation. There was immediate improvement in vision after the operation,

but on the night of the second day she developed a combination of edema of the brain and pressure from that, with rise of temperature, edema of the lung, and cessation of the kidney function, and died. During the first twenty-four hours, while still in possession of her faculties, there was a marked improvement in vision as a result of simple decompression, because I doubt if the mass of tumor taken away in itself was sufficient to have relieved the pressure enough to improve the symptoms.

grammes glucose, slight pyrexia. The eyes showed 6/9 + to Dr. Coffin's question, I think the field was better after the taking off of the posterior end of the septum, and in fact, I first started to do what he had done, not the sub-mucous resection, but I got cold feet. I knew what Hirsch had done, and thought I would stick to that operation. I am sure that the field which I got the third time, when I took out the posterior end of the septum, was better than at the second operation.

I do not know regarding the comparative possibility of sepsis. This child that we thought was going to die after the second operation, developed a tonsillitis with a temperature of 103 degrees, and finally pulled through.

Chronic Influenza of the Nose and Throat.

BY LORENZO B. LOCKARD, M. D.,

DENVER.

At various times cases have been recorded in which influenza bacilli, either in pure culture or in symbiosis, have been found during a period of several months, and in some instances for as long as one and two years.

Usually these have been cases of chronic bronchitis, pneumonia or tuberculosis, although a few have concerned individuals with rhinitis and otitis media.

The patient whose history is recorded presents the unique spectacle of an infection of the nose and throat lasting twelve years, during all of which time cultures of the bacillus influenzae have been obtainable whenever sought for, whether or not subjective symptoms of the disease were present.

In 1902 he had an attack of influenza, which terminated

in a peritonsillar abscess; the pus showed bacillus influenzae. During the next two years three swabs from the tonsillar crypts gave similar findings.

In 1909 his tonsils were removed and after three days a false membrane appeared covering the pharynx and pillars. A culture from this showed the bacillus. In the following two months three positive cultures were obtained. An autogenous vaccine had no effect. Three years later, following an attack of typhoid fever, there developed acute inflammation of the maxillary sinus, the pus from which gave a pure culture of the bacillus influenzae. There was a second attack six months later, with the same bacteriologic findings.

A third attack developed the following winter, when a radical operation was performed, and again the influenza bacillus was found. Three months later an abscess appeared over the second bicuspid. This tooth and the first molar were extracted and the necrosed portion of the floor was resected. A pure culture was obtained from the extracted tooth. Five months later the bacilli were still present.

The literature fails to show a similar case, although cases of chronic infection have been described by several authors.

Bacilli are found in the throat secretions of many normal individuals, and in a large percentage of patients suffering from other diseases. In 172 normal individuals the bacillus was found 43 times, and in 427 patients with other diseases it was present in 215.

Following attacks of influenza bacilli may remain latent in the throat, bronchial tubes or nose, and give rise to recurrent attacks in the individual or transmit it to others. In this way may be explained the eruption of sporadic cases in nonepidemic periods.

For the diagnosis of chronic influenza the finding of the influenza bacillus is not essential, as the symptoms are characteristic. No treatment aside from that which depends upon raising the resistance of the individual has been effective.

NEW YORK ACADEMY OF MEDICINE,
SECTION ON OTOTOLOGY.

Meeting of March 13, 1914.

DR. A. P. VOISLAWSKY, PRESIDENT.

**A Case Showing Spontaneous Radical Mastoid on Left Side and
Acute Labyrinthitis With Facial Paralysis on Right Side.**

DR. LINN EMERSON: The patient shows two conditions. On the left side she gives a history of having had an abscess behind the ear some fifteen years ago. A general surgeon made an incision and pus was evacuated. That was all that was done. She has an opening now behind the ear which is as nice a radical as any one could do. A probe can be passed up into the middle ear without difficulty.

Dr. Emerson said that the patient came to him two days ago to consult him regarding a right-sided facial paralysis. The condition had improved somewhat since then. He questioned her regarding the ear, on that side, and ascertained that she had had a suppurative otitis for the last three months. She was slightly tender over the mastoid on deep pressure. She also stated that about twelve days before, she had been very sick, with what she termed was some sort of ptomaine poisoning, during which attack she vomited profusely and was in bed for three or four days. Her physician diagnosed it as a case of intestinal toxemia and treated her accordingly. She got better, and then suddenly, three days ago, this facial paralysis developed. Dr. Tymeson examined the ears carefully with various tests. The right side shows a dead labyrinth, and she was presented for suggestions regarding treatment—whether, in view of her recent condition and the improvement of the facial paralysis, it would not be better to postpone operation for a while, rather than to run the risk of setting up grave complications. The ear shows nothing but a boggy damaged drum.

DISCUSSION.

DR. TYMESON, replying to an inquiry regarding the functional tests made, states that on the side where the spontaneous radical occurred, the patient hears a 128 tuning fork and has a positive Rinne. On the other side the bone conduction is

faint, and he is quite sure it is referred to the left side. The Weber is positively localized to the left. He was convinced that she was totally deaf on the right side. The point on which suggestions were particularly desired was the advisability of doing a radical mastoid operation on the right side, or letting the patient alone. The facial paralysis had improved and the labyrinthitis seemed to be quieting down.

DR. ALFRED BRAUN asked Dr. Tymeson whether a noise apparatus was used in making the tests for hearing, and how the caloric test was done.

DR. TYMESON said that no noise apparatus was used, and that hot water was used for the caloric test.

DR. BRAUN then stated that it is impossible to make any prognosis or to set the indications for treatment unless positive information is had as to whether the labyrinth is dead or not. Hearing tests are of no value without a noise apparatus. A hot water caloric does not give us positive information unless the water is so hot as to be painful. It should be at least 112° to 115° F.

DR. TYMESON said that the water of 115° F. had been used.

DR. BRAUN stated, further, that it was rather unusual to get a facial paralysis, due to necrosis, in an ear which had been suppurating for only three months. A facial paralysis in an acute ear is not due to bone necrosis and is no indication of labyrinthine involvement. If it really were a chronic ear, with a facial paralysis due to necrosis, he would certainly do a combined radical and labyrinth operation. A radical alone should not be done. This is a dangerous procedure, as it may cause an extension of the labyrinthine infection to the intracranial structures.

DR. BLACKWELL said that he had seen one case which was operated upon six weeks ago, and three weeks after the radical operation the patient developed a facial paralysis, due to exposure to cold while riding against the wind in an automobile, but it improved rapidly after a few days. Possibly the condition of Dr. Emerson's patient was due to the unusually cold weather we have been having.

DR. VOISLAWSKY, referring to the spontaneous radical which occurred on the left side, said that he had seen several of these cases, and that two had been presented at the Academy in the last ten years, but, as he recalled them, each was specific. It might be well to have a Wassermann test made in this case.

Paper: Two Obscure Cases of Resolving Mastoiditis—The Operative Indications.*

BY HUGH B. BLACKWELL, M. D.

DISCUSSION.

DR. DIXON said that he was very much interested in X-ray work just now, although it was quite a while before he was convinced of the value of skiagraphs of the mastoid. During the past two or three years, however, he has been doing a good deal of this work, and there seems to be only one reason for discontinuing it—i. e., inability to read the plates. He has been very much astonished, during the past year, to learn that some of the largest and best clinics in the world have discontinued the taking of skiagraphs of the mastoid.

In Dr. Blackwell's first case, he was inclined to think that the trouble was not in the mastoid but in the attic, and that the patient's head symptoms were due to a low grade meningitis. Any one who has seen any considerable number of temporal bones will remember that in a certain proportion the tegmen is likely to be very thin. It is often so thin that there is no bone at all in probably two-thirds of the tegmen tympani, and sometimes also the antrum.

Not long ago he had made an autopsy on a case which seemed to bear on this point. The patient had a meningitis, and, fortunately, an autopsy was secured. A mastoid operation was performed. An X-ray had been made. He could not recall its reading, but he had not favored operation. The symptoms, however, became so urgent that the operation was undertaken, and a normal mastoid was found. The girl promptly developed a meningitis and died the next day. Nothing was found to account for the meningitis until the tegmen tympani was reached. He did not quite like the looks of it, so removed the dura, whereupon the knife slipped into the attic. There was not the slightest doubt that, in this instance, the meningitis came from the attic; and no person who does a simple mastoid is going to clean out the attic.

In regard to the second case reported by Dr. Blackwell, that is a common experience now. Dr. Dixon said that there are quite a number of these cases, and they are not at all difficult to pick out after they have been carefully X-rayed. One case,

*See page 538.

seen about three or four months ago, that of a man about twenty-eight years old, presented absolutely no symptoms excepting a little uneasiness, such as Dr. Blackwell had described. The fundus was absolutely normal. The patient had given a history of otitis media, but there was nothing except a slight tenderness over the region of the mastoid emissary vein. The X-ray picture showed a probable softening or abscess cavity in that region. The young man was immediately operated upon, and the condition which was found corresponded to the interpretation of the plate.

Another case was skiagraphed on the 16th of February. At that time, Dr. Dixon had not noticed a very small shadow over the sinus, near the mastoid emissary vein. That man is walking about and attending to his business as usual, without paying much attention to his ear, but still under observation. He was X-rayed again today, and, without doubt, he has an abscess cavity at that particular spot, five or six millimeters across. He will be operated upon very soon.

Dr. Dixon said that he wished to call attention to one fact, although he was not altogether sure what importance is attached to it by surgeons in general; but we are learning a good deal from as well as about mastoid skiagraphy. For a while every bone that was found to be hard was regarded as being in all possibility of the sclerosed type, and due probably to long chronic suppuration. Then along came Mr. Cheatle, who called our attention to a number of specimens which showed that, in a large number of cases, an infantile bone and no cells is present on one side, and a pneumatic bone on the other side. Dr. Dixon stated that he had recently been following up a few cases, and had found that the old idea was pretty nearly correct. In one instance the patient came to the hospital, last September. He had a double mastoiditis: both sides cloudy, but at no time did he have sufficient symptoms to warrant a mastoid operation on either side. A number of plates were taken, and, as the condition was gradually clearing up, he was allowed to go out. He had a very large pneumatic type of mastoid on both sides. He returned in January, and both sides were X-rayed again. It was then found that the anterior part of both mastoids (around the antrum and a little below) was clearer, but all the rest of the cells were sclerosed. One could see old septa distinctly, but the bone was solid.

He comes in once a month for X-ray. The man is apparently well, but the process is still progressing. It may go on to complete sclerosis, as the outlying cells of the clearer portion are not quite so clear as they might be.

Dr. Dixon said that he would also like to speak of the matter of furunculosis. It is sometimes exceedingly difficult to make a diagnosis between severe furunculosis and mastoiditis. Many cases have been opened and found to be normal mastoids. There is this to be said: Every case of middle ear disease is a case of potential mastoiditis; the lining membrane of the mastoid cells is likely to be inflamed, and to that extent it is a mastoiditis, and you will obtain a small amount of haziness in the plate, which has to be taken into account. He then showed two or three plates, one of them representing a case of furunculosis on the right side. The left side was pneumatic and perfectly clear. The right side showed the infantile type, also perfectly clear. The furunculosis was treated and the patient got well without operation, although he had distinct symptoms of mastoiditis.

Another pair of plates showed a pneumatic mastoid on the left side, perfectly clear; the right was cloudy, and was diagnosed as a thick cortex with a perisinous abscess. Operation proved the reading to be correct.

Paper: The Treatment of Furunculosis of the Ear With Vaccines.*

By H. BEATTIE BROWN, M. D.

Paper: The Use of Vaccines in Ear Infection, With Report of Cases Treated.†

By W. H. HASKIN, M. D.

Paper: The Bacteriology of the Chronic Ear.

By JAMES G. DWYER, M. D.

DISCUSSION.

DR. WILSON inquired whether there was any very marked reaction after giving the injections.

DR. BROWN replied that out of the seventy-five cases on the list—all of them working people—not one had lost an hour from work.

*See page 600. †See page 582.

DR. QUINLAN said the section was certainly under many obligations to the readers of the various papers. They opened up a new field of thought as well as work for the thinking men of today.

The treatment of many of the chronic ear suppurations is attended with such anxiety and in so many instances with failure, that we are ready—perhaps too ready—to accept any balm for our disappointments in the past. It is to be hoped that the new days of progress may illumine our dark path, and that the vaccines may help us to do what the antitoxins have so well done for many other ailments to which they have been applied so successfully.

DR. MYLES said that the vaccine treatment, as presented tonight by the readers of the papers, was almost a revelation. Unfortunately, these things are usually taken up spasmodically, and the pendulum swings too rapidly, first one way and then the other. It takes a long time for us to get our balance, and there seems to be no way to do it quickly, unless it can be done by following the popular fashion and appointing a commission for the purpose. Of course, the commission would have to be unbiased and should take all the evidence.

What little experience he has had, even with the stock vaccines, has shown some remarkable results, and the method certainly deserves a thorough trial. Of course, there may occasionally be a death, but there are too many deaths following the extreme operative procedures. The papers presented tonight show that the method is well worthy of careful testing.

DR. BLACKWELL said that, personally, he does not feel the radical mastoid is a dangerous operation, and he does not think it is so regarded by the majority of ear surgeons. He believes that often a modified radical operation would be sufficient, without subjecting the patient to the loss of hearing, etc., incidental to the radical procedure.

In regard to the number of cases treated, he understood Dr. Haskin to say that one hundred and eighteen cases were referred to him for treatment, and cultures were taken from only fifty-two of them. He wished to know why cultures were not taken from these other sixty-six cases.

DR. HASKIN replied that the sixty-six cases represented those who did not return and those who responded to treat-

ment from the first. It was not thought necessary to go into those cases, but a large proportion of cases under careful treatment will dry up.

DR. BLACKWELL: The writer stated that of fifty-two cases, in which cultures were taken, thirty-three were injected, and that eleven cases dried up under treatment before receiving vaccine, and seven did not return after the first treatment, so it could not be said whether they dried up or not.

DR. HASKIN: Eleven of the fifty-two cases were cured under appropriate treatment, before any vaccine treatment could be prepared.

DR. BLACKWELL said that he did not see how Dr. Haskin could assume that the beneficial result was entirely due to the vaccine. Thirty-three received the same local treatment that the eleven received who were cured before vaccine was given. It would seem that the treatment which all these received was excellent, and that it must have had something to do with the beneficial results.

DR. HAYS asked whether there was any difficulty in making a vaccine, in those cases of mixed infection where there were a number of contaminating bacteria, which were liable to overgrow the more virulent organisms.

(This was answered in the negative.)

It seemed rather peculiar that a vaccine should be so successful in cases of chronic discharge from the ear, when one considered that they were of little use in chronic nasal sinus cases. Of course, in the subacute sinus cases one gets wonderful results by the use of vaccines.

Dr. Hays said that he wished to remind the members that about two years ago he read a paper before the ear section on treatment of chronic discharging ears by Dr. Yankauer's operation. Nearly all these cases turned out successfully, which he believes due, as was said tonight, to warding off the constant infections from the throat. In those cases where the discharge does not cease entirely, after a successful Yankauer operation, he thinks it would be advisable to use a vaccine.

In regard to the question of stock or commercial vaccines, Dr. Dixon might recall a case of furunculosis treated at the infirmary. When Dr. Hays first saw this man at his home he was suffering from multiple furuncles of the canal. He

immediately had him transferred to the hospital, where it was necessary to incise these a number of times. For two years the patient had had a number of furuncles over the entire body, for which he had been treated with stock vaccine with absolutely negative results. Dr. Dixon prepared a vaccine from the pus of the furuncle in the canal, and gave this patient a number of injections with most gratifying results. He has not had a furuncle now on any part of his body for nearly six months.

Dr. Haskin made a point of the importance of taking the vaccines in the proper way. At the City Hospital vaccine treatment of chronic ear conditions has been tried with very poor results. Dr. Hays believes that this is due to improper technic, as the culture was made from the pus as it exuded from the canal. Dr. Hays said that he would avail himself of what Dr. Haskin had said, and see if he could not get better results.

The three papers that were read this evening were most encouraging, and offer a great deal of hope to every one who comes in contact with such a distressing condition as chronic suppurative otitis.

Dr. VOISLAWSKY said that it is not only the house surgeons who are at fault, but that many of the older men, unfortunately, also use faulty technic.

Dr. ROBINSON said that all are familiar with the excellent results obtained, sometimes, in chronic suppurative otitis by careful local treatment, where personal attention is given daily. In the cases reported by Dr. Haskin, the results would have been more accurate if the local treatment had been given separately and not in combination with the vaccine.

Dr. LEDERMAN said he believed that a number of these cases will improve materially under autogenous vaccines. He has followed the suggestion of Dr. Harvey Cushing in the use of urotropin, and would like to know from Dr. Haskin whether that was given as a test before the vaccine was applied. In a number of cases which he has had under observation this winter—very frank cases of mastoid involvement—he obtained very satisfactory results by simple drainage and ten grain doses of urotropin, together with the application of argyrol to the nose and nasopharynx. These were very distinct cases of mastoid involvement, with temperature, excess-

ive discharge and tenderness over the antrum and tip. He feels that the urotropin was of considerable value in the treatment of acute aural suppuration and nasal infections.

DR. WILSON asked why not treat them with a simple incision and drainage, without the use of urotropin.

DR. LEDERMAN replied that ordinarily they would have been operated upon, on account of the persistence of the symptoms, but that the above treatment was instituted with satisfactory results.

DR. BOWLES said that he did not know whether what he had to say would be of any value, but that he, like others, was interested in remedies that would cure, without operation, if they could be found. He made no claim to know anything about vaccines, but he had tried successfully other ways of getting rid of chronic otorrhea, and had recently been telling the chairman of some of them. One of these patients was a woman of sixty-five years, the daughter and widow of a physician, who had had recurrent attacks of ear trouble since childhood. She got well and has remained so for over two years, with her hearing materially improved. Another case was that of a child, following scarlet fever. An operation for mastoid was performed, but the discharge continued. Under careful treatment this child got perfectly well, and has remained so. In another case which he has been treating after a mastoid operation, in which the discharge continued, one ear is now practically well, with satisfactory hearing, and the other ear is better. Many more such cases could be enumerated, which have been treated without the aid of vaccine and without resorting to mastoid operation.

However, that does not prove anything—just a few cases of that kind. It all depends on what was the cause of the discharge. One case may have healed without treatment, another may have required operation. If anything will do away with operation, it ought to be welcomed.

The doctor said that he was very glad to have heard the papers on vaccine treatment.

DR. DIXON said that he was astonished to hear of the good results obtained in cases of streptococcus capsulatus infection. That was a "scare bug" to him, and had been for a good many years; but lately he has begun to wonder what would happen to a good many of these cases if they were let alone. He is

not so sure, now, that if a capsulatus case gets over its acute form, and the discharge appears to be stopping or even becoming somewhat less, and there are still no definite symptoms of any sort, whether it might not get well without operation. However, in every case that he has seen operated upon, in which a capsulatus infection had existed for three weeks or more, the mastoid process has been absolutely rotten. There was no other word to use. He would hesitate to use a vaccine on cases of streptococcus mucosus.

There is no question that many are too lax in preparing vaccines. Not sufficient care has been exercised, and there have been too many "shot-gun" vaccines made—taking everything that comes along. In many instances the ear was not cleansed at all—simply a swab run into the canal, and the vaccine prepared and shot into the patient. He would not like to have any such preparation injected into him.

From what little vaccine experience he has had with chronic cases, they are liable to recur. That does not seem to have been the experience of the gentlemen who had read the papers tonight, and he was very glad to know it. Perhaps something had been overlooked.

The patient to whom Dr. Hays had referred, and whom he and Dr. Hays had treated together, had not been without a furuncle, on some part of his body, for as long as two weeks in as many years. This man was treated with an autogenous vaccine, and so far as Dr. Dixon knows he has not had a furuncle since. He attributed the result in this case to the vaccine. The treatment was kept up thoroughly for about two months. He had never seen a case with such severe furuncles as this patient exhibited.

Dr. Dixon said that he was very glad to have heard the papers, and congratulated Doctors Brown, Haskin, and Dwyer upon having called the matter to the attention of the section.

DR. HASKIN said that several points were brought up in the discussion which he would like to answer.

Dr. Dixon had spoken of cases with infection of capsulatus mucosus as being particularly dangerous. A number of cases of this infection were included in the list reported. The organism which was isolated in these cases was the capsulatus; what the original organism was he could not say, as the discharge had been present for years.

Replying to Doctors Blackwell and Robinson: All of these cases were first treated by other measures, for not less than ten days, some for three months, eleven months, two years, and three years, respectively, and all failed to get well until the vaccine was given. They received the same treatment that has always been given, and yet they did not heal until they were given the autogenous vaccines, after which they dried up promptly.

As Dr. Nagle's first report was made in 1910, and the second in 1912, some of her cases have now been under observation for over four years, and they have not recurred. He had stated, distinctly, that they did not claim that these cases were permanently cured. They have been doing this work on these chronic cases for only a few months, and no claims of permanent cure are yet justifiable. But the conditions had existed for months or years, and had failed to respond to every form of treatment that had been tried; whereas, under their observation, most of the case improved, as soon as they received the vaccine, and seemed to be cured at the end of the treatment.

As to what Dr. Blackwell had said about not considering the radical mastoid operation a dangerous one, he was afraid that he had not read much of the literature on the subject, or studied the tabulated reports of deaths and complications following the mastoid operation.

In regard to the chronic throat conditions of which Dr. Hays had spoken, they have had, at the Manhattan, a number of cases of ethmoiditis which were treated at the same time with vaccine for chronic suppurative ear conditions. In one girl the pyocyaneus was found in the ear; and she was under treatment in the throat department for ethmoiditis, in which the staphylococcus aureus was isolated. Dr. Dwyer got the vaccine that was prepared for the throat clinic, and combined the two vaccines. Both ear and nose rapidly became dry. She has been kept under observation, reporting every two weeks, and it was hard to recognize her as the same girl.

A remarkable feature of the treatment is the effect on the general condition of children. Instead of being anemic, emaciated children, they become bright and happy, have good appetites, and are completely changed for the better.

Dr. Haskin said that he attributed much of his success, without the treatment of vaccine, to the use of the vacuum cleaner. It is the only method by which one can actually clean out every ear. He would be willing to take any case, after it had been wiped as dry as possible, and show that he could still suck out some secretion. When the ear is once thoroughly cleansed and the proper medicament applied, it is very likely to remain dry. In one instance the patient had been treated for four months by another physician in the clinic, but did not get any better. One thorough cleansing (for taking of cultures which proved to be the pseudobacillus) caused the ear to dry, and it has remained so ever since.

When this method was first tried, they used to clean the ear out with the suction, and then have the patient lie down so that the alcohol would get thoroughly into the ear. But that caused complete sterilization of the interior of the tympanum and killed all bacteria. The smears showed the presence of bacteria, but the cultures showed no growth, as the bacteria had been killed. For that reason, he stopped filling the canal with alcohol, but used a cotton pledget, saturated with the alcohol. Since this plan has been adopted, there has been no failure to get a culture.

Some cases, when thoroughly treated, dry up without further effort; but, as Dr. Myles had said, it was difficult to do this with clinic patients. In private cases, if you take the time and keep them thoroughly dry, you can often succeed. If you give irrigations, however, and tell them to use them at home, you will likely fail. It is impossible for any patient to actually wipe the canal dry, which procedure must be carried out, if we are to successfully treat them.

NEW YORK ACADEMY OF MEDICINE,
SECTION ON OTOTOLOGY.

Meeting of April 10, 1914.

DR. A. P. VOISLAWSKY, PRESIDENT.

**Acute Mastoiditis Following Chronic Suppurative Otitis—Radical
Operation Followed by Pneumonia and Temporosphenoidal
Abscess—Operation—Recovery.**

DR. LINN EMERSON: There is not much to be seen in this case, except that the little girl is now in fairly good health. She has never been a robust child. She weighed three pounds at birth, and had a cleft palate. She is now six years old. About a year and a half ago she was brought to me for a cleft palate operation, and upon examination it was discovered that she had a chronic suppurative otitis of long standing. It was thought best to attempt to cure this condition without operative procedure before undertaking the cleft palate operation. She was accordingly brought to the office every day for careful personal treatment. During this period of treatment she suddenly set up an acute mastoiditis. This condition was not appreciated by the mother, and the child was not brought to the office for several days. Finally, after five days, she brought the child to see me. The little girl was then very ill, had a temperature of 105°, and there was tenderness over the mastoid. She was taken to the hospital for immediate operation. An extensive radical operation was performed on January 4, 1914, and the antrum was found to be full of cholesteatomatous material; the sinus and dura were exposed. The day after the operation the child still had high temperature—between 106 and 107 degrees—and had developed a double pneumonia. The condition was acute, and her life was despaired of, so very little attention was paid to the mastoid wound for the next two weeks, as death was expected every moment. The wound had broken down, the general condition was very unsatisfactory, and all that could be done was to remove the dressings and apply fresh ones. Finally, at the end of two weeks, the temperature came down, the child apparently began to improve, and hopes of her ultimate recovery were entertained. She was very obstreperous during the dressing of the wound, and it was observed that, as she

cried and struggled during the dressing, pus would well out of the wound near the sinus. The interne called my attention to this, and four weeks after the first operation I examined her again, and found that I could pass a probe nearly two inches in the direction of the temporosphenoidal lobe, and that she had a temporosphenoidal abscess which was discharging through the wound. A second operation was done through the old mastoid wound, and upon cutting away the bone, an abscess cavity the size of an English walnut was found. The cavity was packed and drained, and the child made a good recovery, leaving the hospital in June. The middle ear cavity is perfectly dry.

I feel perfectly certain that if her lung symptoms had not overshadowed her brain symptoms, and had her true condition been recognized and the brain operated upon at that time, she would have died. But, fortunately, the abscess cavity drained into the wound, and when she got over the pneumonia the abscess was treated, and she was saved.

DISCUSSION.

DR. FRIESNER asked if cultures were made from the mastoid wound at the time of operation.

DR. EMERSON replied that he thought so, but was not sure.

DR. FRIESNER said that the acute mastoiditis might be a local manifestation of the general pneumococcus infection which so frequently occurs, particularly in children. He had wondered, then, what would be the character of the infection in the presence of pneumonia.

DR. TYMESON replied that a culture was made from the ear and developed streptococcus.

Paper: Double Radical Mastoidectomy in Dementia Precox With Phenomenal Improvement in Mental and Physical Condition.*

By GEORGE E. DAVIS, M. D.

DISCUSSION.

DR. McCULLAGH inquired further about the second case reported by Dr. Davis. As he understood it, the patient was admitted to the hospital suffering with mental trouble, and a month later he developed an acute mastoiditis.

*See page 597.

DR. DAVIS replied that the patient probably had had a chronic ear trouble. He himself had not examined the man until a month later.

DR. McCULLAGH said that he understood Dr. Davis to say that the perforation had healed after the discharge appeared the first time.

DR. DAVIS replied that when the opening in the drum closed the temperature rose. This was followed by a second spontaneous rupture with relief of symptoms, but this did not continue. Then the man had an acute mastoiditis with all the exaggerated symptoms, and after the operation he cleared up completely.

DR. McCULLAGH asked what was the type of the mastoid process and if the bone was ebonized.

DR. DAVIS replied that after getting through the cortex, which was sclerosed, disintegrated bone tissue was found, and the hardened cortex indicated a previous chronic condition.

Paper: Some Labyrinthine Studies.*

BY JAMES A. BABBITT, M. D.

(BY INVITATION.)

DISCUSSION.

DR. VAIL said that it had been a great pleasure to him to come over from Philadelphia to attend this meeting, as it is always an advantage for men to attend meetings in other towns than their own, and to learn how work is carried on elsewhere. He was not, however, prepared to discuss the scientific aspects of the paper, which certainly opened up a number of interesting suggestions, and he had enjoyed listening to it very much. As far as the three modes of locomotion—by air, water, and land—are concerned, most of us get along pretty well by automobile, and the aviation features will not trouble very many for some years to come. If, however, some one could discover a method of preventing the movement of the otoliths produced by the pitching and tossing of vessels on the ocean, it would be a great benefit to those of us who are not good sailors.

*See page 607.

DR. GRUENING: The title of the paper, "Labyrinthine Studies," acts as a lure. We are all desirous of learning more of that intricate subject—the physiology of the labyrinth. He had been much interested in Dr. Babbitt's paper, as it had presented a very good resumé of what is known, but he felt that the writer was a little too sanguine in regard to some points that are less well established. The statement that from the position of the semicircular canal and the inclination of the head we could predict the direction of the nystagmic movements, is not borne out by experience. Furthermore, that the functions of the maculæ in the utricle and the saccule were known, was new to him. As far as his reading went, nothing is known of the physiologic function of either the utricle or the saccule and their maculæ.

The subject of the vestibular labyrinth is exceedingly interesting, both from the ophthalmologic and the otologic standpoint. Necessarily, every labyrinth must be connected with every ocular muscle on both sides, and each labyrinth must be connected with all the ocular muscles. Only in this way can we explain all the nystagmic movements which occur.

Ordinary locomotion has become automatic. We are not aware that we use our muscles. It is only when we balance ourselves (e. g., the tight rope), that we become conscious that we are equilibrating. Therefore, there must be a connection between the cortical center and the labyrinth. The sub-cortical centers are used to do the automatic work, but when we become conscious of the fact that we must equilibrate, we balance, and that is done with the cortex, consciously. To consider vertigo merely in its connection with the ear or the eye is not sufficient. There is vertigo due to cortical irritation.

Putting everything together, it would seem that the nystagmic movements are not so simple as they have been described to be by either Bárány or others. Bartels has done some very good work along these lines, and his articles, published in *Graefes's Archives*, in 1910 and 1911, are well worth study.

DR. EAGLETON said that one phase of the question which has interested him very much was not touched upon by the writer of the paper, and from the clinical side it is very important. As he understood it, Dr. Babbitt had been trying

to arrange a correlation between an induced nystagmus—the ability to balance, and certain coordinated acts, and also the relation to vertigo. What the physiologic action is we do not know; but one factor was not spoken of which is very important—i. e., disturbances of intracranial pressure.

Dr. Eagleton said that during the past few years he has been much interested in watching the effects of induced nystagmus in cases of tumor of the brain. Two years ago he directed attention to the fact that in tumors of the brain there is a quickly induced nystagmus—the vestibular apparatus is hyperesthetic. This observation has been confirmed by observation on numerous cases. Within the past week he had seen a patient who was thought to have a tumor of the brain. Nystagmus was induced, and when a few drops of water entered the ear the patient had a strong nystagmus. Later on, as the increased intracranial pressure adapts itself, there is an anesthesia of the vestibular apparatus; and if you try to induce nystagmus in such patients by the cold and heat tests, you will find it almost if not entirely impossible. He has had three cases in which the caloric tests were applied many times, and the galvanic tests also, and it was impossible to produce a nystagmus. In the case of patients who have tumor of the brain and suffer naturally from vertigo, it is often impossible to make them dizzy by stimulation of the vestibular apparatus.

Another thing is the fact that we have, in the lack of ability to induce nystagmus, a symptom of increased intracranial pressure. Dr. Eagleton expressed the hope that Dr. Babbitt would consider the question of intracranial pressure in his future studies along this line.

Dr. DAVIS said that he had been especially interested in the reference to the origin of muscle tonus. Dr. Babbitt had cited Ewald's law, that a tonus from the labyrinth goes out to the musculature of the whole body. Some two or three years since, Bárány, at Basel and at the Psychological Congress in Innsbruck, gave as his opinion that the vestibular apparatus plays only a subordinate function in the maintenance of equilibration and muscle tonus, and that it was the major function of the cerebellum to tone up and increase the musculature, by means of the so-called proprioceptive reflexes. Therefore, while the vestibular apparatus, as well as the kinesthetic or muscle and joint reflexes, contribute to this tonus, they are not essen-

tial; and this seems all the more plausible when we remember with what facility, and in a relatively short period, equilibration is reestablished after the ablation of both labyrinths, which goes far in substantiating Bárány's claim along this line. Bárány further contends that another contributing function of the vestibular apparatus is the toning up of the various centers of the cerebellum which takes place in the resting condition.

DR. FRIESNER said that he had been much interested in Dr. Eagleton's remarks concerning the influence of increased intracranial pressure on the reflexes from the vestibular apparatus. In the last case that Dr. Eagleton described, in addition to the loss of reaction to the caloric stimulation, there was also a loss of reaction to the galvanic current. This condition indicated that the conductivity of the nerve had been abolished—i. e., that the conductivity of the nerve had been destroyed by the tumor.

The term, brain tumor, seems to have too wide a scope—tumors in the posterior fossa would possibly be more apt. Dr. Friesner suggested that the disturbances in the labyrinthine reflexes were not due to intralabyrinthine changes, brought about by pressure, but to direct or indirect involvement of the eighth nerve or of the centers in the cerebellum which influence the nystagmus reflex. It is known, for instance, that there are centers in the cerebellum which exercise inhibitory influences on the nystagmus.

Dr. Babbitt's paper was exceedingly interesting and opened new fields of thought.

Dr. Friesner agreed with Dr. Gruening's statement that very little is known about the maculæ. Lee, Kubo, and others have shown that certain eye movements are the result of stimulation of the end organs in the vestibular apparatus. Seasickness, according to Bárány, is due, in part, to irritation of the maculæ in the vestibule. It is unaccompanied by nystagmus. If it were due to irritation in the end organs in the cristæ, it would be accompanied by nystagmus. Bárány states that so long as his head was in the horizontal plane he was not seasick, but the moment he raised his head, even though his body was supine, he was sick, and vomited. This must be due, he argues, solely to organs contained within the head, and he concludes that the only organs that come into consideration are the maculæ.

The psychic influences on the vestibular reflexes are very interesting. It does not seem certain, however, that music can be classed in this group, for the reason that the theory was advanced, long ago, that the involuntary movements that accompany the hearing of dance music are the result of the impression upon the acoustic labyrinth, transmitted to the static labyrinth—that is to say, that they are tonic movements of the muscles engendered through the indirect irritation of the non-acoustic labyrinth.

DR. MEDING felt that in the discussion one should not forget the author's careful statement, "that the figures and charts presented were too cursory and limited for basic thought." Dr. Babbitt has tried to stimulate us to a further and useful study of the labyrinth and its effects on equilibration. Certainly the subject appeals. Former remarks on the subject of intracranial pressure and dizziness did not, however, seem to tally with experience. We have dizziness with low pressure, and high tension without dizziness. We have dizziness in the young and in the old. Seasickness has been referred to every organ of the anatomy, and, strangely enough, has been relieved, in some instances, by the various remedies suggested by the proposed cause—so a belt has served some, and bromid others. As to the position of the body, no difference has been experienced by those known to Dr. Meding. In some measure, at least, these various movement sicknesses seem to be neuroses; and if the labyrinth be connected with every impulse receiving part of the body, we are yet at a loss.

DR. DUEL said that the remarks of Dr. Meding in regard to intracranial tension called to mind a case which might be relevant. Three years ago a stock broker, who had been under treatment for otosclerosis, had developed such extreme and frequent attacks of vertigo that he had been incapacitated for work. Dr. Duel had directed his attention to the reports of Drs. Putnam and Blake, in which they had attempted to relieve dizziness by removing a small quantity of spinal fluid by lumbar puncture. The patient was impressed, and at his request twenty to thirty cubic centimeters of fluid had been removed. The relief had been so pronounced that since then he had had only two serious attacks of dizziness until quite recently, when he had again begun to suffer from frequent distressing seizures. Only yesterday, at the patient's urgent

request, Dr. Duel had removed twenty cubic centimeters by lumbar puncture, hoping that he would again be relieved.

Dr. Duel said he had never been able to explain satisfactorily how vertigo was relieved by spinal puncture, unless it be by some reduction of intracranial tension. We do not know much about it. Fortunately, we have learned enough about the simpler functions of the labyrinth, so that we can generally diagnose pathologic conditions and know fairly well when and when not to operate, but, so far as the higher problems are concerned, we have still a long way to go.

DR. GRUENING said: The statement of the previous speaker, "that we now know exactly when to attack the labyrinth by an operation," is certainly not borne out by the literature of the subject. We do not yet know with certainty in which cases the labyrinth should be operated upon. Much light has recently been thrown on this subject, and we may hope for safer guides in future.

DR. BABBITT, in closing the discussion, said that he had not considered the question of tumors in the preparation of the paper. He trusted that the members of the section would remember that he had stated, at the outset, that the material which was presented had been offered instead of another study which had been planned, and that the results were merely suggestive. It would not be fair to make any sweeping deductions, such as one might be tempted to draw, from the eighty cases which had been studied. He simply presented his deductions from these eighty cases, studied under the conditions described, as the personal estimate of one individual. It would be a totally false basis to work upon, unless a sufficient number of cases were studied to give an average which would be absolutely convincing.

The vestibular test was not judged entirely as to the length of time, and the length of time should not be recorded as the index; it simply represented those which prolonged the maximum vestibular reflex and in marked degree. The study presented was neither pathologic nor surgical, but was simply a basic functional study.

NEW YORK OTOLOGICAL SOCIETY.

Stated Meeting, March 24, 1914.

DR. FRED WHITING, PRESIDENT, IN THE CHAIR.

Radiographic Pictures of the Jaw.

DR. WILLIAM H. HASKIN presented a number of radiographic pictures of the jaw, with a unique card container. Among the number of pictures was one very indefinite print, in connection with which it was explained that by using contrast papers in printing it is possible to bring out more than is shown on the film or X-ray negative. By rephotographing and reprinting with this special paper, a great deal more can be made out of weak pictures.

Instrument for Use in Exploring a Brain for Abscess.

DR. J. R. PAGE presented a small instrument for use in exploring a brain for abscess, which had been suggested to him by Dr. Farrington of Memphis. It was constructed, after the fashion of Lucae's bayonet forceps, with thin blades, on which the distance was graduated in centimeters. It could be introduced into the brain with the blades closed, and by means of a set screw the blades could be allowed to spring open to a regulated degree for the evacuation of the abscess and the introduction of drainage. He also called attention to a celloidin tissue, to be used for drainage, which can be placed under the dura of a dog and left there for months, without causing irritation. The material also comes in tubes. The tissue can be boiled as long as desired. Dr. Frederick Prime, who had been experimenting with it in the laboratory of the College of Physicians and Surgeons, published an article about it in the November number of *Surgery, Gynecology and Obstetrics*.

DISCUSSION.

DR. PAGE, closing the discussion, said, in reply to a question by Dr. Whiting concerning the friability of the celloidin

tissue, that it seemed to vary, some specimens being very fragile, others tough. Dr. Prime had declared it to be absolutely nonirritating. Answering a question by Dr. Lutz, regarding the feasibility of using the tissue in septal tears, he said he knew of no one who had employed it in such cases. His own experience with the material was limited.

Otitis Media Purulenta Chronica With Hallucinations.

DR. J. A. KENEFICK gave a history of a woman who had been coming to his clinic for perhaps four or five months, complaining of what was diagnosed as otitis media purulenta chronica. This condition had been controlled by treatment. On two or three occasions polypi had been removed and final healing took place. X-ray pictures had been made of the mastoids. On the affected side the cells were somewhat cloudy; on the other side they were clear. There was no mastoid tenderness; nothing to justify a diagnosis of anything more than simple otitis media. During the course of this trouble the woman, who is about thirty-four years of age and married, began to have hallucinations. She had often come to the clinic saying what "they" would do to her. There was no history of insanity in the family. She had various obsessions, chiefly of a sexual character. He had never had a patient describe such apparently real occurrences. According to the history she had never manifested this mental condition before the ear began to discharge. It was possible that the brain was involved, as it has been found to be in so many institutional cases. He referred to Dr. Bryant's observations on cases of chronic catarrhal otitis media at the State Hospital for Insane, in which there were hallucinations.

DISCUSSION.

DR. S. H. LUTZ said he thought the ear condition was not necessarily the cause of the insanity. A few years ago he had seen a number of cases at the Long Island Hospital in which there was middle ear suppuration of long duration, yet when some of them came to autopsy, no connection between the ear and the brain was shown. The two conditions in Dr. Kenefick's case might be merely coincidental. He asked if any cases had been reported in which a connection between

the middle ear suppuration and the mental condition had been demonstrated.

DR. THOMAS J. HARRIS called attention to three cases, recently reported in the *New York Medical Journal* by a doctor of Philadelphia, the patients consulting him on account of the symptom of "hearing voices." The patients were all women, and all were over fifty-five years of age. The specialist in mental diseases who reported the cases thought there must be some disturbance in the cochlea. The diagnosis of the otologist was chronic middle ear catarrh. The women were otherwise perfectly well. These were not institutional cases; the patients were mothers of families, and were attending to their household duties.

DR. KENEFICK, closing the discussion, said no Wassermann test was made. The woman was the mother of three children, and aside from the conditions mentioned seemed to be perfectly healthy. Inasmuch as there had been no mental symptoms present before the ear was manipulated, the question presented itself as to what might be started up by that manipulation. He did not know that the polypi had been removed, as it was against the rules of the hospital to remove polypi in the clinic. Dr. Dixon assured him that the roentgenograph disclosed nothing suggesting cerebral growth or abscess.

Brain Abscess.

DR. E. B. DENCH, discussing a case of brain abscess reported by Dr. Eagleton, said that he was in the habit of exploring the abscess by means of a director which was graduated in quarter inches in a manner similar to the needle presented by Dr. Page. After the director had entered the abscess cavity he was then in the habit of introducing a rectangular retractor made of pure silver. The retractor was constructed of such thin material that it would bend rather than bruise the brain tissue. The retractor being introduced along the director until it entered the abscess cavity, the director was then withdrawn, and a second retractor, a counterpart of the first, was passed along the retractor already in the abscess cavity. The second retractor entered the cavity of the abscess. By separating the retractors gently a complete view of the abscess cavity could easily be obtained without any injury to normal brain tissue. The cavity of the abscess

could we wiped out and subsequently packed. Dr. Dench believed that these retractors served a better purpose than the encephaloscope.

Otitis Media Purulenta With Dehiscence of the Tympanic Roof.

DR. ROBERT LEWIS reported a case of otitis media purulenta with dehiscence of the tympanic roof, meningitis, and death.

Notwithstanding the fact that a radiograph showed the mastoid cells to be normal, he determined to operate, as the clinical picture was complete.

There was a streptococcic infection, considerable discharge, tenderness on pressure over the mastoid process, and a marked sagging of the posterior and superior portions of the external auditory canal wall. Upon operation the mastoid was found to be absolutely normal. About thirty hours later the patient, a woman, developed a high temperature, $105^{\circ} + F$. A few hours later a lumbar puncture showed pus to be present in the spinal fluid. Within forty-eight hours she died.

The autopsy showed a dehiscence in the tympanic roof, with the dura adherent around the edges of the opening, and eroded within the center of this adherent area, from which point the purulent inflammation extended above over the vertex forward and downward.

At the operation a small portion of the dura had been exposed over and back of the mastoid antrum, but was free from evidences of infection, and at the postmortem showed no signs of infection at this point.

If an autopsy had not been performed he would have been at a loss to explain the cause of the purulent meningitis from which the patient died, and would have considered himself culpable because he had not operated.

He regretted the inability to obtain more autopsies, which often reveal an error in diagnosis, but which in this case showed that there was no cause for self-criticism.

DISCUSSION.

DR. KENEFICK recalled a previous discussion by this society of the subject of dehiscences in the tegmen tympani, and shortly afterward he asked Dr. Dixon what the X-ray photo-

graph could be expected to disclose in these cases. The latter thought it would show nothing unless there was a marked shadow. He asked if any such evidence was observed in Dr. Lewis' case.

DR. LEWIS, in closing the discussion, said after the operation he could discover a little shadow on the X-ray plate, but he could not have read it from the plate itself. Having seen the result of the autopsy, he could make out a little spot which he thought was the dehiscence.

Streptococcus Mucosus Capsulatus Infection.

DR. WILLIAM H. HASKIN, discussing a case of streptococcus mucosus capsulatus infection reported by Dr. Duel as having been successfully treated with autogenous vaccines, mentioned three cases, in two of which the patients recovered, while the third died. One patient was being treated by Dr. Dwyer at the same time Dr. Duel was treating his case.

DISCUSSION.

DR. GRUENING did not consider these cases convincing with regard to the autogenous vaccine. When a thrombus has been removed and the jugular ligated the temperature often remains high for a few days, then subsides, and most of the cases, providing the operation has been thorough, recover. This applies to cases with oscillating temperatures, as well as to those without. He did not think the use of the vaccines had changed the character of the disease. The important thing was to find the thrombus and remove it, tying the jugular. One of Dr. McKernon's cases in which no operation was performed is entitled to special consideration.

DR. JAMES F. MCKERNON said when the thrombus is removed and the jugular ligated and resected the operator has gone as far as possible, so far as the macroscopic infection is concerned; but in some cases all infection was evidently not reached, for the reason that the temperature does not subside. In such cases the use of the autogenous vaccines simply aids convalescence. In Dr. Duel's case he had gone as far as he could, but the patient did not get well, and looked as if he could not live twenty-four hours. For that reason the autogenous vaccine was suggested. The speaker had had

other cases since the first report, and he was by no means convinced that it was not a good practice, after removal of all macroscopic thrombotic material, to give large and frequent doses of the vaccine for the purpose of hastening convalescence. He had seen no results from the use of the vaccines that were detrimental to the patient, except soreness at the point of injection.

DR. E. B. DENCH thought that the point about ligating the jugular below all macroscopic evidence of infection not well taken. A thrombus in a vessel frequently hangs down for a considerable distance in the lumen of the vessel. He recalled one case in which the clot was suspended like a stalactite in the vessel, and projected downward for fully three-quarters of an inch. He thought it wiser to excise the jugular from a point low down in the neck to a point above the origin of the facial vein. We know that some cases of sinus thrombosis get well, although the clot in the sinus is not disturbed, as evidenced by cases found long years after sinus thrombosis has occurred, in which the sinus is completely obliterated by the organization of the clot, without any interference whatever with the jugular. When the vein is interfered with, it is Dr. Dench's opinion that it should be resected from a point low down in the neck to a point above the origin of the facial vein. In some cases the clot may not be infected, but infection of the vessel wall is frequently present in these cases, and this may lead to a bacteremia. In one case which had recently come under his observation the clot extended down to the torcular and down to the bulb. The mastoid operation was a long one, the radical operation being necessary in this case, and the patient lost considerable blood incident upon clearing the clot out from the sinus. In this instance the jugular was not interfered with until the third day after the primary operation, but on the third day an abrupt rise in the temperature and the general condition of the patient made jugular excision imperative. This patient made an uninterrupted recovery, although on the second day after the removal of the vein the temperature rose to 106°. The patient then made an uninterrupted recovery, although two weeks after the vein was taken out there was a sudden, unexplained rise in temperature to over 104°. Had vaccines been used in this case, they would certainly have been credit-

ed with having effected a cure. He thought, therefore, that one should be very careful in attributing a cure to vaccines, owing to the irregular temperature which these cases frequently run, irrespective of vaccine therapy. He believed that vaccines might be valuable in giving the patient increased resistance. At present, however, he was not prepared to endorse vaccine therapy in all these cases.

DR. WENDELL C. PHILLIPS said this was a subject worthy of careful statistical consideration. Final results seemed to be about the same, whether the vessel is ligated or dissected. The method of ligating had one distinct advantage. The patient was usually very much exhausted from the preceding operation, and the simplicity of ligation, requiring only from five to ten minutes, was decidedly in its favor.

DR. T. PASSMORE BERENS called attention to two different classes of these cases. In one there is a decided septic thrombus. At the point of the thrombus, and perhaps a little on each side of it, the vein is discolored, the rest of the vein appearing normal. This is the usual form. In some cases, however, there may or may not be a demonstrable thrombus—the vein contains white striations extending far above and below the seat of the infection. With one or two exceptions, in his experience, all of this class of cases had been fatal. In one case in which autopsy had been obtained, the whitish striations extended from the point of infection all the way down the vein to the innominate, and along the walls of this into the vena cava. Sometimes the whole vein is white or whitish. In all of these cases the vessel should be ligated and excised as far down as may be possible—and the sooner this is done the better, in order to avoid the spreading of the phlebitis.

DR. GRUENING thought the more thorough the operation the less the need for vaccines. He always tied at the clavicle and removed the entire vein, and he had seldom had a recurrence of the temperature.

CHICAGO LARYNGOLOGICAL AND OTOLOGICAL
SOCIETY.

Regular Meeting, held March 17, 1914.

PRESIDENT, DR. OTTO J. STEIN, IN THE CHAIR.

**Report of a Case of Necrosis of the Superior Maxilla With a
Sequestrum Containing Three Incisor Teeth Which
Look Externally at Least to be Normal.**

DR. L. W. DEAN, of Iowa City, Iowa, reported this case. The sequestrum was produced in a very unusual manner. The patient, a female, about seventeen years of age, gave a history of having had her teeth regulated. This regulation had been carried on for nine months preceding the time that the patient came into Dr. Dean's care. The specimen shows around the roots of the three teeth near their apices an elastic band, of the kind which orthodontists use in regulating teeth. The band had evidently been forgotten or lost, and had wandered down along the roots of the teeth to near the apices and produced the sequestrum.

**Exhibition of Specimen of Brain Showing Nothing Except a Small
Temporosphenoidal Abscess.**

DR. DEAN reported the case of Mr. B., white, aged thirty years, admitted to the University Hospital on January 13, 1914. The patient had suffered from chronic otorrhea in the right ear for nine years. About a month previous the patient had had an attack of dizziness, which was not accompanied by vomiting or headache, and since then he had had several dizzy spells.

Examination showed the eyes to be negative. Ears: Right, no hearing, tympanic membrane destroyed, canal filled with pus, tympanic cavity contains granulations, caloric negative; left ear, negative. Examination of blood: Leucocytosis, 10,400; polynuclear count, seventy-six per cent. Physiologic nystagmus to the left and right. Station: Patient falls to the right, regardless of the position of the head. Pointing test: With the right hand, to the right; in the absence and in

the presence of an induced nystagmus, to the right. Left hand normal; in the presence of an induced nystagmus, points to the left.

Operation on the right mastoid, January 14th—temporo-mastoid exenteration. Cortex of mastoid eburnated. Large area of necrosis around the antrum. There was a large perforation in the inner table of the middle fossa. Labyrinthectomy was performed, discovering a large fistula in the semi-circular canal. The seeker introduced into the fistula readily entered the vestibule. The bone in the solid angle was soft and necrotic, the necrosis extending to the posterior fossa. The bone was removed to the dura, exposing it in the posterior fossa anterior to the sinus and in the middle fossa over the tegmen antri.

Following operation the patient had slight facial paralysis; no nystagmus; pointing test was normal with right and left hands, and the station was normal.

On February 13th, the patient complained of headache and being dizzy. On February 14th, there was much pain in the head, some rigidity of the muscles of the neck, no Kernig, no muscular twitching, reflexes normal. Blood count: Leucocytosis, 23,000; polynuclear of seventy-nine per cent. Lumbar puncture showed slight pressure. Examination of spinal fluid: Fehling's solution not reduced; Noguchi globulin, positive; cell count, 9,000 per cubic millimeter. Subdural drainage was performed. For several days the patient's condition was very much improved. On February 19th the patient became much worse and died of meningitis. On autopsy a small abscess in the temporosphenoidal lobe was reported, about the size of an acorn, which had ruptured into the meningeal space, and general diffused septic leptomeningitis, most marked in the middle fossa on the right side.

The interesting things in this case were: Were these cerebellar symptoms the result of some change in the posterior fossa, or were they secondary to the brain abscess in the temporosphenoidal lobe? Dr. Dean thought that the symptoms were due to a collection of fluid between the dura and the cerebellum that was secondary to the labyrinthine lesion which was removed, or at least had its pressure dissipated, by the bony decompression operation that was performed when the labyrinth was operated.

Dr. Dean then reported a second case of brain abscess, as follows: Mrs. B., white, aged fifty-two years, admitted to University Hospital, February 3, 1914. For the past three or four years the right ear had discharged at times, the last time in the late fall. Patient said that she had had terrible pain in the temporal region, just above the ear, all the time.

Examination: Patient moans and complains constantly of terrific pain in the head. Mental condition very poor. Constantly agitated and suffers from a delusion of unpardonable sin and being in the power of the evil one. Examination of the eyes negative, except for a neuritic atrophy of the right optic nerve, with a vision of six-ninths in that eye. Examination of the ears: Right ear, whisper heard at ten feet, drumhead scarred and thickened; positive caloric. Left ear, examination negative. X-ray of mastoid shows eburnated bone, or mastoiditis on the right side. Examination of blood showed a leucocytosis of 12,000, with a polynuclear count of seventy-six per cent. Urine and spinal fluid negative. Diagnosis: Chronic mastoiditis with extradural abscess or cerebral abscess.

Operation, February 6, 1914, mastoidectomy. Cortex of the bone hard and eburnated, tegmen antri and mastoid cells posterior to the antrum necrotic. The dura was exposed in the middle fossa and found bulging and covered with rough granulations, but not under increased tension. In hunting among the granulations a small opening in the dura directly over the tegmen antri was found. On stretching this opening no cerebrospinal fluid escaped. Some of the brain substance removed from the inner surface of the dura with the curette showed pus cells, necrotic tissue and streptococci. Material removed from the depth of one-half inch in the brain gave the same findings. The diagnosis was made of brain abscess with discharging sinus through the dura. The sinus was very slightly enlarged and a plain piece of gauze inserted three-fourths of an inch into the brain. Following operation the patient's condition was somewhat improved, but she still complained of the pain in her head, and the result was unsatisfactory. The temperature, which had been ranging from 99° to 101.5°, continued the same. Ten days after operation, because of temperature of 100° remaining, and because of the patient's general condition not improving, a second

exploration of the brain was made. Following the same pathway, at a depth of two inches, an abscess cavity was opened. From it fully an ounce of pus escaped. A gauze drain was inserted.

Following this procedure the temperature returned immediately to normal, the pain disappeared, but the patient's maniacal condition persisted. A colleague saw the case and made a diagnosis of melancholia, with the cerebral infection being only a contributory factor. It was found impossible to drain the abscess cavity thoroughly with a gauze drain, and on March 20th a rubber tube was inserted. At present the tube is in position, but there is no discharge of pus. Outside of the mental condition, the patient is practically normal.

Dr. Dean then reported the case of Mr. B., white, aged fifty-one years, seen in consultation on March 9, 1914. On May 1, 1913, the patient had had a mastoidectomy, with obliteration of the lateral sinus, for mastoiditis and sinus phlebitis. Early in the fall of 1913 the patient complained of headache and roaring in the head. The pain was in various parts of the head, but always on the right side. Otherwise the general health was good. At times the patient was dizzy. On the morning of March 9th the patient complained of headache, and said that his head had been aching for several days, and that there was pain in the right ear. Patient worked at his usual vocation of driving a motor car throughout the day without apparent trouble. In the evening, while in a barber chair, the patient said: "My, I feel deathly sick," and in a few minutes he was unconscious. He was examined by two physicians, who reported him unconscious. There were no reflexes present, except a very slight contraction of the pupil to light. There was complete general anesthesia, including the corneæ, except over the squamous portion of the right temporal bone, where tapping with the finger produced a spasmodic contraction of the muscles of the face and eyelids. The patient was moved to the hospital, arriving there the evening of March 10th, about ten o'clock. Examination of the general nervous system was negative; examination of the urine, negative; blood pressure, 95 mm. of Hg.; spinal puncture revealed a clear fluid, under apparently normal pressure; temperature 98.8°; pulse 60; respiration 20; examination of the eyes revealed pupils small, reaction to light

sluggish, a very fine horizontal nystagmus present, shown only by using the ophthalmoscope, fundi normal; examination of the right ear showed the right drumhead reddened and slightly bulging.

Operation.—A semicircular flap of skin, fascia, muscle and periosteum was elevated from the temporal region, the incision extending from the upper part of the mastoid in a circular direction, upwards, forwards and downwards, to the anterior border of the posterior end of the zygoma. The flap was dissected downwards so as to expose the upper border of the external auditory canal. The dura was tense and reddened. It was painted with tincture of iodine and then incised. Incision of the dura resulted in the escape of a small amount of fluid under pressure. The brain did not bulge into the opening, so we were probably dealing with a localized meningitis. The brain was explored. At a depth of one and one-half inches from the lateral surface, over the tegmen tympani, a softened area was discovered. A gauze drain was inserted, the semicircular flap replaced, and a vertical incision one and one-half inches long made directly over the incision in the dura. Through this incision the drain was passed and moist compresses applied.

The morning following operation the mental condition was good. His brother, who was with him during the night, said that after the effects of the ether were gone he was apparently mentally all right. In the morning he recognized the speaker immediately, although he had not seen him for six months before, and then only a few times. His temperature was normal; pulse 70 to 80. On the fourth day the drain was removed, and the patient has been apparently well since. At the time the drain was removed a condition new to us was observed. Following the withdrawal of the gauze drain eight or ten very large bubbles of gas escaped. They came from the bottom of the cavity and carried with them pus and pieces of the brain debris. Unfortunately, they were not able to get a culture of the gas forming microorganism which was probably the specific cause of the trouble. There has been no opportunity for the admission of extraneous microorganisms. In this case Dr. Dean thought that the sudden attack of unconsciousness was due to the formation of gas in the cerebral cortex.

DISCUSSION.

DR. JOSEPH C. BECK had talked with Dr. Dean about these cases before the meeting, so felt that he could say something about them, having had a chance to think them over and look up the question. From the remarks the doctor made, in presenting this wealth of material, it was almost impossible to discuss the cases and say anything definitely about them, especially the first one. He thought that all the symptoms the patient had could be very easily explained on the labyrinthine irritation rather than any brain irritation. Patients with labyrinthine irritation will have a falling to that side, and the pointing test usually made in that condition is not very dependable. At least, he has not found it at all reliable. At any rate, the small temporosphenoidal abscess there could scarcely come from contiguous pressure on the cerebellum—there could not be sufficient pressure there to produce these symptoms. While the doctor said the case had necrosis of the labyrinth, yet it might have been a localized labyrinth necrosis. There might have been some remains of the vestibular apparatus present. He had examined a case the day previously in which irrigation with hot and cold water gave absolutely no reaction, in a case of supposed labyrinthine destruction, yet when he turned the patient he got a very lively reaction.

The case of gas formation in the brain interested him because he had had recently a case of abscess, with pure culture of a motile bacillus, which was bacteriologically proven to be a bacillus pseudodysentericus, class 2, according to the reactions used for the identification of this class of organisms. The case looked as though it might have been typhoid, or a bacillus coli communis infection, but it proved to be the bacillus pseudodysentericus, and that case had gas formation in the region of the abscess. The group of colon bacilli have that tendency.

Regarding the case of necrosis of the teeth, he thought there was insufficient cooperation between dentists and doctors in this line of work. He had shown a case to Dr. Dean which he would like to refer to briefly, which was quite similar. A patient came to him having an ulcer of the septum, and he could not account for the trouble in the nose—that is, from

any nasal affection. This patient complained of pains all along the face. So he sent the patient back to her dentist, and said that he could find nothing to account for her pain. The dentist told the patient to "get a good nose doctor." The speaker had her teeth examined by another dentist, and he discovered a crowned tooth which he thought was at fault. He simply took off that tooth-cap, and there was a dead, black tooth, and underneath it was a sequestrum, one-quarter inch in diameter, and beyond that an area of necrosis. And that was the point he wished to make, with reference to the difficulties that he was meeting constantly, in that the dentists did not cooperate sufficiently in the differential diagnosis and treatment about affections of the nose, throat, mouth and ears, and the teeth.

A Protest Against the Noncensorship of Advertisements of Surgical Instruments, Etc.

DR. ARTHUR M. CORWIN pointed out that through the efforts of the Council on Pharmacy and Materia Medica of our national association, the medical profession, and therefore the public, has come to find something like security against fake drug combinations and secret formulæ that not so long ago found advertising space even in our best journals. By way of contrast, one may see the glaring misrepresentations contained in various advertisements of surgical instruments that still appear in such journals. Numerous examples were cited. It is high time that the pirate and impostor, the dealer in false pretense, should be shown up and driven out of business or compelled to reform. A proper committee or council should be established to scrutinize the goods and the pretensions of this class of advertisers, in order to protect the buying profession from instruments purported to be patterned after certain approved models, but which are often travesties upon the real thing. These grotesque imitations fail utterly in making good, and therefore disgust the purchaser and bring discredit upon the surgeon whose name the original instrument bears, and upon the operation or technic which he has recommended in good faith. There is no more reason for misleading the profession through false advertising of things surgical than of drugs.

DISCUSSION.

DR. R. H. BROWN asked if he was right in saying that recently an ordinance had been passed declaring against this fraudulent advertising, so that it is perfectly possible for a man to sue in a case of this kind, bring the evidence up in court and obtain judgment?

DR. CORWIN answered that there might be a local ordinance to that effect.

DR. BROWN said that if that were true in Chicago, then it would be a very easy matter to bring up such an impostor, get judgment, and have that judgment published, without any serious reason for a come-back on the part of the manufacturer. It would be one of the best ways, perhaps, of bringing such frauds before the public.

DR. E. PYNCHON thought there was nothing new about the idea of instruments being made entirely different from the design of the one who first got the instrument up. He had had similar trouble with his nasal speculum. The first ones were gotten up by Truax, Greene and Company, and were charged for at the rate of \$3.50. Different manufacturers reduced the price until eventually a firm in Philadelphia makes them drop forge, and sells them for fifty cents, and these are no good. He very often sees instruments bearing his own name that he could not use himself. They are not only advertised in catalogues, but he sees the advertisements for them in medical journals, and he also sees such instruments in physicians' supplies stores. It is wrong for surgical instrument dealers to reproduce different patterns of instruments so as not to conform with the design originally called for by the inventor.

DR. J. HOLINGER said that usually things that are cheap in price are cheap in quality. He did not think it was the society's business to protect those who do not want to pay the money for good instruments. They deserve to be fooled. There is nothing new in that. But he wanted to ask Dr. Corwin where he would draw the line between cheap instruments from an acknowledged cheap firm, and worthless ones from a good firm? For example, there are chisels being sold every day by a well-known, first-class house which do not deserve the name of chisels, and these instruments are sold at fair prices. He had experience with them and spoiled nine

chisels in one mastoid operation. Either they simply bent over so that the edge was practically double, or they were too hard and large pieces broke out. How would Dr. Corwin guard against that? We have no control over the open market. If the society would appoint a committee, as Dr. Corwin suggested, Dr. Holinger was afraid its members would be in hot water from the very start.

DR. CORWIN, in closing, said that the matter referred to by Dr. Pyncheon brought up a very different phase of the question, namely, the pirating by different houses of instruments made by a certain house, which did not appear in the journal as advertised. He had referred in his paper only to journalistic advertising. That is a thing the society could get at.

The medical colleges have been gotten at; also the drug concerns and advertising quacks. The advertising of surgical appliances is just as tangible.

He differed from Dr. Holinger when he implied that the medical profession, as made up of individuals, should paddle its own canoe as individuals, and with no idea of the fundamental proposition that we are our brothers' keepers. Anything we can do to help each other is certainly in line with organized medicine and the ethics of our profession. It is a duty and a privilege to help the other fellow. To let a lot of irresponsible manufacturers misrepresent us to the public is wrong. The matter of the steel not being properly tempered is bad enough, but when an instrument comes out with a ratchet on it that has no function at all, and when such instrument was totally unlike the originator's model, he thought it was time for the profession to act.

He had simply attempted in his brief paper to voice a protest against that sort of thing, and to stem the tide of that kind of misrepresentation as far as possible.

Paper: Report on Twenty-six Cases of Tonsillectomy Two or More Years After Operation.*

BY ALFRED LEWY, M. D.

DISCUSSION.

DR. ARTHUR M. CORWIN thought papers of this type might be very valuable in pointing a way for us, not only as oper-

*See page 592.

ators on tonsils, but in other regions of the body, by taking up the subsequent results and trying to analyze those results in terms of the operations and the indications for those operations. Perhaps we have been too lax in doing that and have overlooked the importance of it. We have hundreds and perhaps thousands of patients who have been operated on for specific things in a specific way, and we do not know today what the conditions of those patients are and how far those conditions can be interpreted in terms of the operation, and of the indications for which the operation was done. Therefore, he would compliment the reader of the paper at the outset for his point of view.

Great emphasis could be put on that first proposition, but, as the essayist said, very little of value rests with so small a number of cases. As he referred to laryngitis in one or two cases, it occurred to Dr. Corwin that laryngitis, pharyngitis, dryness and a lot of other symptoms have been reported in the literature, but how far those conditions are referable to the systemic background or other complications or habits and manner of the patients' living, we would have to go into before laying any stress upon the fact that patients have had other conditions following resection of tonsils and removal of adenoids, and just how far these conditions were dependent upon the operation. Of course, that is drawing a long bow, to say that laryngitis in those cases was due to the results of operation. And so with regard to the size of the patient's uvula in those cases. The results seem very uniform. So wide are the results of a beneficial nature, so far as the size and growth and development of the brain and structural function in these cases are concerned, that we do not hesitate to say, where tonsils and adenoids offer a local regional or systemic reason for being removed, they should be removed.

Again, the matter of tonsillotomy under the age of the second dentition the speaker would not discuss, for lack of time, further than to differ from the essayist's position.

DR. JOSEPH C. BECK thought the weakest point in the presentation of Dr. Lewy was the fact that these were dispensary cases, and the conclusions which we could draw from these cases are different from those to be drawn from cases from private practice. For instance, the question of hygiene

comes in, in the after-treatment, and differs very much in dispensary and private practice. Dr. Beck would like to have a report of ten private cases which had been followed and studied with that point in view—the ultimate result. The question of the ultimate result is bound to be touched on more and more, not only in the matter of the tonsil, but in goiter, appendicitis, and other things.

Dr. Beck has made a study of the question of tonsillectomy in relation to arthritis, particularly, and, as he had said on previous occasions, he could not recall more than two distinct cases that had had pure joint or rheumatic infections that, when operated for the removal of the tonsils by tonsillectomy, had ever had another attack. He had many cases under his observation, adults particularly, who had had arthritis and septic symptoms, who were markedly benefited, so far as their symptoms were concerned, as long as a year after operation. At the end of that time they had recurrences to the degree that they were just as bad as before. It is not a question of the tonsil alone, but other foci of infection that we must study, especially now that the enthusiasm is so great and the work is thrown on the laryngologist. Everything is referred to the tonsil, everything comes from the tonsil, and we are liable to fall into that error and say yes, remove the tonsil, and then see the symptoms come back—the same symptoms that were operated for, particularly in reference to arthritis. He has been very much disappointed in his ultimate results in adult cases of removal of tonsils for the cure of rheumatic affections. There has been a general improvement—that is true—but the actual cure of the condition has not taken place. He would like to hear men who were enthusiastic on that subject express themselves on the ultimate result five years later. He thought the subject was very interesting.

DR. SHAMBAUGH expressed surprise at the large percentage of unfavorable results in the series of cases reported by Dr. Lewy. He could hardly understand what the indications were for the operation, or, in other words, what they were trying to cure by the removal of the tonsils, where there could be seventeen unfavorable results out of twenty-six operations. The chief indication for the removal of faucial tonsils in children is a history of repeated attacks of acute

tonsillitis. Now, in all these cases there is bound to be a favorable result, as the child will not have tonsillitis again. Another indication for the removal of tonsils in children is the presence of very large hypertrophied tonsils, often obstructing the respiration. Here, again, we can have only a favorable result from an operation. If, on the other hand, we remove tonsils which have not been subject to repeated attacks of tonsillitis, and where there is no marked enlargement, because we hope that their removal may have a favorable effect upon, for example, the tendency which the child may have to contract head colds, or because the child has purulent otitis media, I think it not unlikely that we shall be disappointed in most cases in the result. The relationship between the presence of adenoids and persistent nasal catarrh, as well as the persistence or recurrence of purulent otitis media, we all recognize. On the other hand, aside from the acute otitis media and the acute nasal catarrh which follow upon attacks of acute tonsillitis, I am inclined to doubt the tonsils as an important etiologic factor in disease, either of the nose or the middle ear.

Take another class of cases, where the indication for the removal of the faucial tonsils is the existence of a systemic infection which has followed an attack of tonsillitis—for example, an endocarditis or acute Bright's disease. Here I believe that the removal of the faucial tonsil is certainly indicated, as the recurrence of the systemic infection is much more likely to take place through a subsequent attack of tonsillitis than from any other source. The result of the removal of the tonsil in such cases should not be classed as unfavorable, simply because the case happens to develop a recurrence of the systemic infection through some other route. I repeat, that the removal of the faucial tonsils in such cases removes the most probable gateway for a recurrence of the systemic infection.

As regards the arthritides, the situation is quite similar. If a person has an attack of articular rheumatism which follows directly upon an attack of tonsillitis, we all of us accept this evidence that the systemic infection which has caused the rheumatic trouble has gotten in through the tonsils, and in all cases where the joint trouble is at all serious we advise the removal of the tonsils. In most of the cases with a history of this sort the joint trouble will clear up promptly after the re-

removal of the tonsils. In other cases, however, where the relationship between the tonsils and the joint trouble seems to be established from the history, the removal of the tonsils may not result in the immediate clearing up of the infection in the joints. The reason for this seems to be that in some case the infection that has taken place in the joints is sufficient to continue even after the original focus has been removed. In other cases these joints which have once been infected seem to remain sensitive and much more likely to develop acute reactions from sources of infection other than the tonsils. Dr. Shambaugh believes that the cases of joint trouble which distinctly follow upon an attack of tonsillitis, and which are not entirely cured by the removal of the tonsils, do not constitute an argument against the removal of the tonsils in these cases. He pointed out, however, the danger of erring on the side of allowing oneself to do unnecessary things for imaginary tonsil trouble. The speaker has removed a great many tonsils because of systemic infections, such as chronic nephritis, chronic arthritis, neuritis, etc. In all cases of this sort where the systemic infection has not followed directly upon an attack of tonsillitis, or where the presence of foci of infection in the tonsils could not be positively demonstrated, every effort should be made to discover other foci.

DR. J. HOLINGER could only say, "I told you so." Four and five years ago he showed cases before this and other societies where tonsils had been removed, and subsequently the patients had complained of practically the same symptoms as before operation. So that is nothing new. But he thinks the profession ought to draw one conclusion, namely, to stop hammering into the people's heads the idea that the removal of the tonsils is a panacea against all and every illness, and especially is this the case in the schools.

DR. BURTON HASELTINE thought Dr. Lewy's idea a splendid one, but agreed with Dr. Beck, that it is pretty difficult to judge of the end results in clinical cases. He was quite surprised at the percentage of poor results reported, but he did not think, in justice to Dr. Lewy, they should be discussed without knowing more details as to the conditions existing previous to operation. We don't know how much of the trouble reported later existed before operation; for instance, in the matter of suppurating ears. As he understood

the essayist, quite a number of the reported cases were operated for the purpose of relieving or curing the suppurating ears, and in no case was the statement made as to whether the patient was treated after operation or not. It is extremely improbable that removal of the tonsils alone was expected to cure these cases.

He agreed with the other speakers that if we could make records from private practice it would be of far more value, for several reasons: First, the results in private practice are more vital to us; second, we possibly are more conservative in advising operation in private than in dispensary cases. Also, we are more apt to know the end results, since if they are not good, we will hear of them much sooner. So that while he thought the idea was a splendid one, and we should all follow it up, he hoped that other reports would include private as well as clinical cases. Any positive conclusion from such a limited number of cases would be exceedingly questionable.

Dr. LEWY, in closing, said that the gentlemen who criticised the small number of cases were perfectly justified, but the report was gotten up in the hope of encouraging the preparation of other reports of like nature by men who had perhaps more time to devote to it, and could report on three or four hundred consecutive cases. He did not think we could draw any definite conclusions from twenty-six cases.

In each case he stated the cause for which the operation was done, but did not read them all on account of lack of time.

The question of tonsillectomy and tonsillotomy he would not go into either, since Dr. Corwin was kind enough not to start anything, but he presumed the differences of opinion were both founded upon theory.

Dr. Beck's criticism, that the patients were from dispensary practice, and that we cannot judge the results in private practice from those in dispensary work, was, of course, true. Patients in private practice frequently have other treatment than the mere removal of the tonsils, and this is also a factor in the end result; clinic patients more frequently have only the operation to which to credit the result. Also, the fact remains that the very large majority of tonsil operations that are done in the community are done

in dispensary practice, and if four or five hundred cases would average as poorly as these twenty-six, we are doing a gross injustice to the dispensary patient, in the way of doing unnecessary operations. He believes that he refuses more cases than he accepts for operation at the Eye and Ear Infirmary—cases that have been referred from the schools—this in reference to Dr. Holinger's remark.

His intention is to follow his cases for a little while and judge the results—the cases that he refuses to operate as well as those in which operation is performed.

Another object of the paper was as a protest against indiscriminate tonsil operation, and he thinks that it is in the clinic that we are a little bit indiscriminate in operating. If the child has had a sore throat, the tonsils are usually removed. The cases should be studied a little more thoroughly.

One of the best indications for removal of the tonsils is frequent repetitions of tonsillitis. The cases in his report that were helped were just such cases.

The removal of tonsils for aural suppurative processes and nonsuppurative deafness is, he believed, commonly practiced. Personally, he could not see the sense of it, as removal of adenoids alone is usually all that is necessary; but it is his experience, in visiting other clinics, that it is considered a good indication for removal of the tonsils, and so also in many of the textbooks.

Dr. Shambaugh did not hear him read the reasons for the paper. He is thoroughly in accord with those who wish to remove tonsils for systemic infection, when they can reasonably show that the cause lies in the tonsil, and when they can find trouble in the tonsil itself, but he is not in favor of removing the tonsils just because they are there and moderately enlarged.

The Unusual Findings in Frontal Sinus Disease.

DR. J. HOLINGER, in a paper on this subject, said that an account of interesting indications and findings at operations on the frontal sinuses had been given at different times, especially in the *Muenchener medicinische Wochenschrift* ("Frontal Sinus and Maxillary Antrum Operations"), 1913. Two new cases were added. The first was that of a woman of fifty-five years, treated within the last few years for two

acute attacks of inflammation of the right frontal sinus. A fresh attack, apparently worse than the preceding ones, kept her in bed for the last ten days. Hot and cold applications were of no avail. The entire right side of the head seemed red and swollen. The right eye also was swollen. Several groups of blisters seemed to be caused by too hot applications. In the nose, pus was seen laterally and medially to the anterior end of the middle turbinal. Operation was advised, on account of the experience of the preceding attacks, and because the patient begged for immediate relief. Extradural or intradural involvement could not be excluded, but was rather a probability. As soon as the head was shaved, similar blisters were found on the cortex as on the face, but these were strictly confined to the right side of the middle line. A diagnosis of herpes zoster was made. A radical Killian operation was performed, in spite of this new development, because we knew that the sinus was chronically inflamed, and the herpes zoster could well be a consequence of the sinusitis, as the supraorbital nerve often is exposed in the sinus. At the same time the nerve could be stretched. At the operation the sinus was found filled with pus and polypoid degenerated mucous membrane. The nerve was exposed and stretched out of the foramen. The result of the operation was great relief from pain. Slight attacks at great intervals could not be compared with the former suffering. Recovery took more than a month, but is complete.

The second case was that of a man, twenty-eight years of age, a baker, who in May, 1913, fell against a sharp edge with his right temporoparietal region. Was not unconscious, but was sick for several weeks. In September he began to have fierce headaches on that side. In the beginning of October the right eyelids and forehead were swollen. The headache was at its worst in the morning, and disappeared at about three in the afternoon, every day. The frontal sinus was washed daily, affording considerable relief in the beginning. The pain was worst at the place where the trauma occurred and over the forehead. X-ray plates gave no new information. The diagnosis was empyema of the frontal sinus, with probable brain abscess. At the operation, November 11, 1913, an enormously large frontal sinus, reaching from temple to temple, and well into the hair line, was found. In the inner

plate a fracture line could be traced in the upper right hand part, in the direction towards the region where the trauma had occurred. The recovery was slow, taking until January. The headaches stopped, but a peculiar pain became more and more circumscribed in the temporoparietal region. This area became smaller and smaller, until it finally was about the size of half a dollar, and could be accurately circumscribed by pressure with the finger or percussion. Finally, this pain, too, disappeared.

Of course, only a postmortem would have cleared up this case, but Dr. Holinger thought the following explanation was not far amiss: After the trauma in May, a brain abscess developed, infected from the close proximity of the frontal sinus. After the operation, when the source of infection was removed, the abscess healed. It is well known that a brain abscess does not need to leave a scar in the brain.

DISCUSSION.

DR. OTTO J. STEIN said there is no doubt that, owing to the great variety in the size, shape and position of the frontal sinus, probably more than any of the other nasal accessory sinuses, we have to be on the lookout and alert to the changes in symptoms and pathology of this particular sinus. The cases reported by Dr. Holinger simply warn us of the unusual conditions that are constantly brought to our attention.

DR. J. R. FLETCHER said that the case of herpes zoster interested him very much. He had mentioned before picking up a section of bone of the head in which there was complete dehiscence of the bone. That is, the superior orbital nerve was absolutely exposed in the sinus. Instead of there being a canal, there was dehiscence of the bone. In other words, this nerve was lying in a little notch, the floor of which was the membrane of the frontal sinus. Dr. Fletcher expressed the opinion then that that might occur in cases of orbital herpes, which are seen occasionally.

He had in mind a case that occurred in his own practice in which there were gangrenous spots, and the patient today has quite a number of pits all around the orbit. A neurologist was present that evening, and afterwards he said he would like to remind Dr. Fletcher that all of those cases were dependent upon inflammation of the ganglion. He was per-

haps convinced against his will, and has been of the same opinion still, that that was not necessary, that herpes zoster could be caused by having a nerve bathed in pus, where the nerve trunk itself was bathed in pus, and Dr. Holinger's experience seemed to bear him out in that opinion. Perhaps, after all, the condition referred to as occurring in the specimen he showed a couple of years ago would occur in some of those cases where the nerve is exposed—not running in a canal, but running in a groove that is covered on the outside by dura and skin, and on the inside by mucous membrane only. He has the specimen referred to in his possession now. There is no bone between the nerve and the frontal sinus at all. As soon as the nerve was removed the sinus was exposed.

DR. JOSEPH C. BECK wanted to speak with reference to the radiogram exhibited by the essayist. He would differ from him that it was a brain abscess case. He thought it was a case of bone necrosis. At least, that would be his reading of the X-ray picture. It looked to him like a scarification of the bone and absorption, as we see it particularly in syphilitic cases, in the early stages.

He has seen these large frontal sinuses, such as Dr. Holinger described, but truly frontal sinuses. In this connection he wanted to speak about the Killian operation in these large sinuses. He did a radical Killian operation in a man who had a very large frontal sinus, very deep. He thought there was a double frontal sinus, from before backwards. Dr. Cavanaugh, who was present, assisted him in the operation. He thought it was a very rare case, but on looking up the literature he found that it was perhaps a very large ethmoid cell behind the frontal sinus, as Logan Turner has shown quite a number of them. The recent work of Warren Davis shows that distinct double frontal sinus does exist. This patient was cured of his frontal sinus trouble, with not a very large deformity, still he has pestered the speaker and probably will continue to do so on account of a so-called scar through his eyebrow, and he imagined the cross incision, employed by Dr. Holinger in his case, would probably be still worse.

He would judge from the paper that Dr. Holinger is doing a lot of frontal sinus work by the Killian radical method. He personally is not doing the frontal sinus work so radically

as Killian does; he is trying to avoid it as much as he can.

The X-ray picture of the antrum referred to was not taken in the proper angle, and therefore he did not feel that it would be possible to use it as a guide for operation.

DR. GEORGE E. SHAMBAUGH stated that experience had taught him that most cases of frontal sinus infection can be adequately relieved by intranasal operation. In most cases the suppuration can be stopped entirely; in others, even though the suppuration does not entirely cease, the free opening into the nose relieves the patient from the pain as well as from the danger of an intracranial complication. During the past year he has operated upon two cases where an external fistula into the orbit existed, and in both cases the operation was followed by the immediate spontaneous closure of the fistula and the relief of the discomfort which the patient had suffered because of the obstructed drainage of the nose. The intranasal work for the relief of a frontal sinus abscess includes the thorough removal of the anterior ethmoid cells; that is, of those ethmoid cells which drain into the middle meatus. If the intranasal work is done carefully by one who understands thoroughly the anatomic relations in this region, the patient is not exposed to any serious danger. The speaker has operated on a great many frontal sinus cases in this way, and has never had a dangerous sequel. The external operation, as devised by Killian, may have to be resorted to in the few cases where adequate relief cannot be obtained by intranasal work, but these cases are extremely rare. A patient who is free from pain and who understands that the danger of an intracranial complication is in a large measure removed by the establishment of free drainage into the nose, is usually much happier, even with the continuance of some nasal discharge, than he would be to have a scar such as is always left by a Killian operation.

DR. HOLINGER, in closing, said that he thought he was conservative in his operations on the frontal sinus. In neither of the cases reported did careful intranasal work, carried on for a long time, relieve the patient.

The case of herpes zoster had been treated for several acute attacks before. There was absolutely no difficulty in getting into the sinus for ventilation and washing. Neither the patient nor the speaker is sorry that the radical opera-

tion was performed. The patient was very grateful that the fierce pains stopped after the operation. No other means could have produced that result.

Regarding the other case, of probable brain abscess, he would only say to Dr. Beck that there was no syphilis in the case. There was no indication for suspecting any other disease of the bone.

DR. BECK asked if there was no injury.

DR. HOLINGER said that of course there was an injury, but it was not visible, as it occurred seven months previously. We know that after a trauma to the skull there are sometimes fractures of the inner plate, followed by abscess of the brain. It seems quite plausible that at the time of the injury a fracture line ran from the place where the injury occurred down into the inner plate of the enormously large sinus, and that the infection traveled from the sinus along the fracture line to the lacerated brain tissue.

As to the deformities following the Killian operation, he does not see many deformities following it, and he does not see either how he is going to limit his indications for the operation. He always treats patients intranasally, but, as he said, everything has its limitations, and in neither of the cases that he has operated so far, would he have seen any possibility of a lasting result from intranasal work.

**Paper: Pemphigus Involving Primarily the Mouth and Throat,
With Report of Cases.***

BY ROBERT SONNENSCHN, M. D.

DISCUSSION.

DR. W. T. MEFFORD asked the doctor what these people die of—what is it that kills them—what are the pathologic findings, other than the local sore? Again, he would like to ask the doctor whether he has tried autogenous vaccines. It seemed to the speaker that this was a field for their use.

DR. OTTO J. STEIN recalled a case of pemphigus which he saw when a medical student, and it made a great impression upon him. These cases are very rare, of course, to nose and throat men. The dermatologists formerly looked upon them

*See page 619.

as quite rare, but now they do not seem to be quite so infrequent. The case referred to was very extensive, involving the skin over the entire body, and also the mucous membrane of the mouth, throat and trachea, and the entire intestinal canal, as was later shown by autopsy. He received the impression at that time, from the professor who demonstrated the case at the clinic, that almost all of these severe acute cases died. The case was so extensive, and made such a vivid impression on his mind, that he has often thought of it in connection with other eruptive diseases that he has seen at different times since, although he has never seen a case that he could call acute pemphigus.

He also referred to the cases that were seen at St. Louis in November—chronic cases of the mouth and throat, which were very interesting.

DR. JOSEPH C. BECK said that Dr. Stein's remarks reminded him of a case in his family. An old lady, now ninety years of age, about fifteen years ago had an acute pemphigus, of the giant form of blebs, and was seen by a number of men expert in this line. They all gave an unfavorable prognosis, and said she would die from this disease. At that time a paper appeared in the *Journal of the American Medical Association* by a man in Chicago—Dr. Dubs. He had just returned from Europe and reported a case that he had treated at Kaposi's clinic of that type that recovered. This was the treatment: He placed the patient in a bath tub, in bicarbonate of soda solution, and kept her there for nine days, daily coming and opening a number of these large bullæ, and never taking the patient out of the water. She was kept there under stimulants of brandy and being fed all she would eat, and she recovered. She had pemphigus of the mucosa also.

DR. J. R. FLETCHER a few years ago had the good fortune to see a case of acute pemphigus of the hemorrhagic form, the blebs being of about cherry size. The same day he also saw a case of herpes. In both cases the blebs were on the pharynx—very distinct, and but for the color in the case it would have been very difficult to have distinguished them. At least, that was his conclusion. Mere inspection of the case would not have gone very far.

As he understood it, these cases are more numerous abroad—either they are discovered more often, are better diagnosed,

or else it is true that they are more numerous there than here. He thinks we ought to look out for them. A colleague a few days ago mentioned a case to him in which the diagnosis was urticaria. Of course, that does not necessarily form blebs. They were wheals, more or less, but he said that on the top the membrane was somewhat eroded and had a whitish appearance. The speaker wondered whether the diagnosis was correct, or whether it was a case of pemphigus or herpes.

DR. SONNENSCHNEN asked if they were small vesicles on the pharynx, to which Dr. Fletcher replied in the affirmative.

DR. SONNENSCHNEN asked how long they had been present, and Dr. Fletcher said only a very short time, as he understood it. They were perfectly new blebs.

DR. L. W. DEAN, of Iowa City, said that the only case of pemphigus that he had ever had was in the hospital at the present time. The patient came under his care for the first time nine years ago, and at that time had pemphigus of the skin, conjunctiva, cornea, and some blebs in his mouth. Treatment was not very successful, and the patient came to Chicago, went from Chicago to New York, from there to Berlin, and from there returned to Iowa, the pemphigus continuing in spite of treatment received in each city. It did not do much damage in the mouth. It was a chronic case. He lost his vision in one eye. He developed entropion, with ulcer of the cornea, and lost the vision in the other eye, when the chronic pemphigus disappeared. He came under the speaker's observation then, and he sent him to the college for the blind. He developed measles. He has had no nodules for four or five years. This had seemed to him a very unfortunate, but very interesting case, from the very beginning up to the present time.

DR. SONNENSCHNEN, in closing, and answering Dr. Melford's question, said that vaccines were not tried in this case because, in the first place, he did not think of using them; second, about six weeks after first seeing the patient he was seriously injured and only knows the rest of the history from the other physicians. Regarding the cause of death, he does not know that that is definitely known, except that gradual emaciation and cachexia appear, as in other toxic conditions, and apparently that was the cause of death in the case reported.

As to Dr. Stein's statement, dermatologists do see these cases, but those are the cases that show themselves on the skin, and which are easy to diagnose. The point he wished to make was that diagnosis was made by expert dermatologists before the lesions appeared on the skin; in fact, in this case the lesions appeared on the skin very late in the disease.

Dr. Beck's case was an acute one, and at the same time showed lesions in the mouth. That is very rare. The essayist had tried to emphasize the point that the acute cases, beginning with the lesions in the mouth, are almost invariably fatal in a few months.

Dr. Fletcher's case, with blebs in the pharynx, was a very unusual condition, because these blebs usually, as Chiari has shown, burst shortly after formation.

Regarding Dr. Dean's case, the lesions may recur and disappear for a long period of years.

The point made in the paper was simply with reference to the acute lesions in the mouth.

DR. FLETCHER said that he had seen the two cases he referred to in Chiari's clinic.

BOOK REVIEWS.

Operative Surgery of the Nose, Throat and Ear.

For Laryngologists, Rhinologists, Otologists and Surgeons.

By HANAU W. LOEB, A. M., M. D., Professor of Ear, Nose and Throat Diseases in St. Louis University, in collaboration with JOSEPH C. BECK, M. D., R. BISHOP CANFIELD, M. D., GEORGE W. CRILE, M. D., EUGENE A. CROCKETT, M. D., WILLIAM H. HASKIN, M. D., ROBERT LEVY, M. D., HARRIS P. MOSHER, M. D., GEORGE L. RICHARDS, M. D., GEORGE E. SHAMBAUGH, M. D., and GEORGE B. WOOD, M. D. In Two Volumes. Vol. I. Four Hundred and Nine Illustrations. St. Louis: C. V. Mosby Company, 1914.

There has long been a place for an up-to-date treatise on the surgery of the nose, throat and ear. The large experience which the editor has acquired in medical work is a guarantee in advance that the subject would be properly presented. He has associated with himself in the preparation of the work a group of men whose reputation is national: Joseph C. Beck, R. Bishop Canfield, George W. Crile, Eugene A. Crockett, William H. Haskin, Robert Levy, Harris P. Mosher, George Shambaugh and George B. Wood. The work is in two volumes, of which this is the first. The paper is good, the type is clear, and the illustrations, of which the volume contains many, are for the most part original and well executed. Decided credit is due the publishers, Mosby & Company, for the get-up of the book.

Volume I covers the surgical anatomy of the nose, pharynx, larynx and neck, by Dr. Loeb and Dr. Wood; the external

operations of the larynx, pharynx, esophagus and trachea, by Dr. Crile; laryngoscopy, tracheoscopy, esophagoscopy and gastroscopy, by Dr. Mosher; and plastic surgery of the nose and throat, by Dr. Beck. Volume II will be devoted to the more specialized surgery of the parts under consideration. The text is surprisingly free from errors.

Chapter I, dealing with the surgery of the anatomy of the nose, is by the editor-in-chief, and is clear and concise. It embodies his own special investigations upon the size and position of the various accessory sinuses. With one or two of his statements, however, we are at variance. On page seven he states that it is necessary usually to resect the middle turbinate in order to probe the sphenoidal sinus. This we have rarely found necessary to do. On the same page he states that the two lower turbinates, the inferior and middle, extend about the same distance forward. Certainly in the specimens with which we are acquainted, the inferior is found considerably in advance.

Chapter II, by Dr. George B. Wood, deals with the surgical anatomy of the larynx, pharynx and neck, and Chapter III with the surgical anatomy of the ear, by Dr. George E. Shambaugh. Both of these are well written. Shambaugh's opening sentence, that the anatomy of the ear cannot be gained from textbooks nor by operations upon the cadaver, will be supported by every aural surgeon. He urges with great justice the continual study of specimens in order to acquire the proper knowledge. The chapter on the external surgery of the larynx, pharynx, esophagus and trachea (Chapter IV), from the pen of Dr. George W. Crile, is peculiarly welcome, inasmuch as it represents the views of one who is recognized as a master in this field of surgery. It is an exceedingly practical presentation of the subject, covering the special difficulties and dangers, the selection and care of the tracheal canula, emergency and planned tracheotomy, laryngectomy, esophagotomy, stenosis of the larynx, cancer of the pharynx and

esophagus, excision of the tonsils for cancer, and operation for diverticula of the esophagus.

Chapter V, by Dr. Mosher, deals with laryngoscopy, bronchoscopy, esophagoscopy and gastroscopy. It covers one hundred and twenty-three pages, and is the clearest and most authoritative presentation of the subject in English since Jackson's book appeared. It is replete with illustrations, and the information given is so explicit as to cover almost every condition which may arise. The author's well known views in regard to the use of general anesthesia for esophageal work and the employment of large tubes are set forth at length. There is, however, no attempt to insist upon this procedure to the exclusion of local anesthesia and the usual size tubes. The author's method of employing both distal and proximal illumination, as the case may present itself, is undoubtedly the right position. Particularly valuable are the sections dealing with the treatment of stricture of the esophagus and of spastic stenosis of the esophagus, with both of which the author has had a large experience.

The concluding chapter of the book is upon the plastic surgery of the nose and ear. It is by Dr. Joseph C. Beck. We know nowhere of so capable a presentation of the subject. It deals with the history of the subject, and then gives a detailed description of the various operations, external and intranasal.

If Volume II, yet to appear, equals in merit the present volume, the work will be one that every specialist cannot fail to have in his library.

Harris.

Nasal Accessory Sinuses.

Development and Anatomy of the Nasal Accessory Sinuses in Man. Based on two hundred and ninety lateral nasal walls, showing the various stages and types of development from the sixtieth day of fetal life to advanced maturity. By WARREN B. DAVIS, M. D., Corinna Borden Keen Research Fellow, Jefferson Medical College, Philadelphia. Octavo of 172 pages with 57 original illustrations. Philadelphia and London: W. B. Saunders Company, 1914. Cloth, \$3.50 net.

It must be accepted that this work is a distinct addition to the literature on nasal accessory sinuses. A part of it deals with a subject which is not often dwelt upon and seldom if ever sufficiently illustrated to make the rather obtuse study of embryology clear to the mind of the average laryngologist. This book belongs to the atlas class of publication in that the illustrations are by far the most important part of the work. Out of the 170 pages only 53 are devoted to the text inclusive of tables. The rest of the book is taken up with really beautiful illustrations, most of them life size. The material on which the work is based consists of fourteen embryos and fetuses under one hundred and thirty-five days old, and eight fetuses between one hundred and thirty-seven and two hundred and forty-six days, four full-termed fetuses and one hundred and one postnatal heads. This gives a grand total of one hundred and forty-five heads, meaning an examination of two hundred and ninety lateral nasal walls and accessory sinus areas. The author states in concise form his method of obtaining the material at autopsies and the necessary technic for the subsequent examinations. The early embryology of the nasal cavities is given in a general consideration of the subject, and the late embryology treated in each chapter pertaining to the particular sinus discussed. The text is clear and concise, and for the small size of the book covers

the subject in a very complete manner. The best part, however, is the illustrations. They consist of excellent reproductions of drawings from the author's sections and dissections, well elucidated with attached text, and sufficiently numerous, not only to cover all possible normal relations, but also to cover some of the more common varieties.

The book is exceedingly well gotten up, well printed with large clear type on a good quality of paper. When in addition to this excellence of publication we consider the wealth of material from whence the data was drawn, we can scarcely fail to give this little atlas a very warm recommendation to those who are interested in the accessory sinuses.

Wood.

